ADVISORY COMMITTEE ON WAY AND STRUCTURES

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD PLANS

Return to
GENERAL ENGINEERING DEPT.
File

THIS BOOK FOR USE OF
MR.

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NOV. 1937

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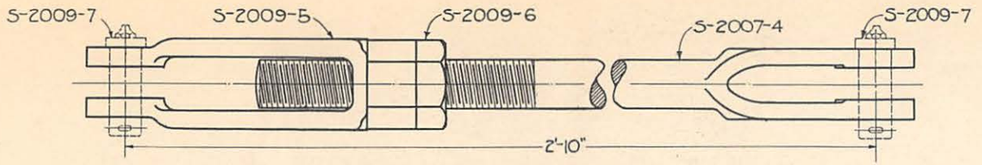
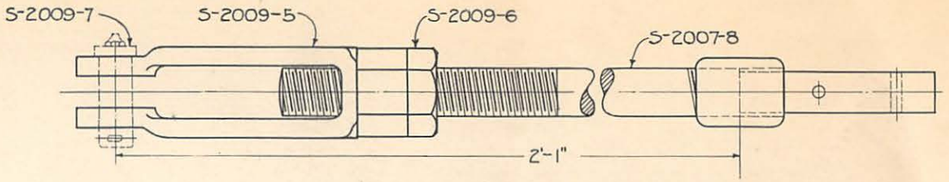
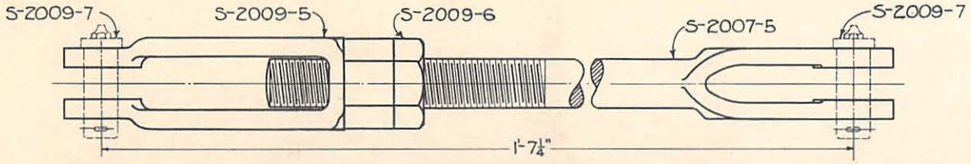


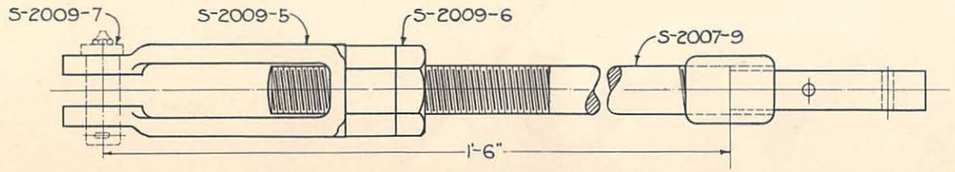
S-2006-1 PLUNGER LINK WITH PINS AND COTTERS COMPLETE
S-2006-2 PLUNGER LINK ONLY
OPEN HEARTH STEEL



S-2006-7 SCREW JAW WITH TANG END WITH PIN AND COTTER COMPLETE
S-2006-8 SCREW JAW WITH TANG END ONLY
OPEN HEARTH STEEL



S-2006-3 ADJUSTABLE LINK WITH PINS AND COTTERS COMPLETE
S-2006-4 ADJUSTABLE LINK ONLY
OPEN HEARTH STEEL



S-2006-5 TANG END WITH SCREW JAW WITH PIN AND COTTER COMPLETE
S-2006-6 TANG END WITH SCREW JAW ONLY
OPEN HEARTH STEEL

SCALE IN INCHES
0 ½ 1 2 3 4 5 6

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT

ERIE RAILROAD COMPANY
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THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
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PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

C.B.P.	C.D.M.	A.J.P.
C.S.L.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
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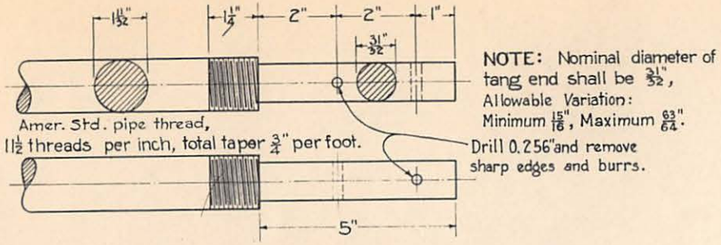
PERE MARQUETTE RAILWAY COMPANY

STANDARD SCREW JAW AND ADJUSTABLE LINK ASSEMBLIES

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: MAR. 17, 1931
CHIEF ENGINEER

S-2006



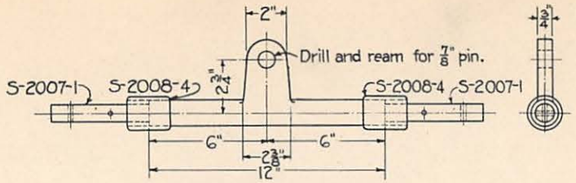
NOTE: Nominal diameter of tang end shall be 31/32", Allowable Variation: Minimum 15/16", Maximum 63/64".

Drill 0.256" and remove sharp edges and burrs.

S-2007-1 DETAIL OF TANG END FOR 1" SIGNAL PIPE

OPEN-HEARTH STEEL

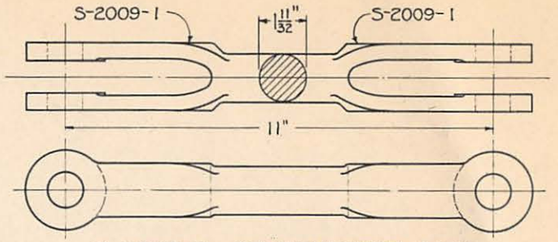
SCALE ②



S-2007-2 LUG

OPEN-HEARTH STEEL

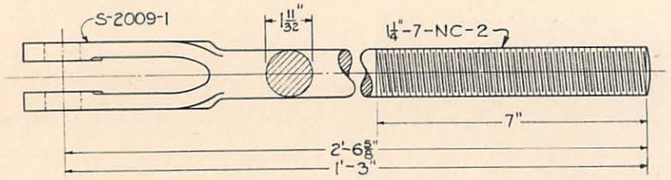
SCALE ①



S-2007-3 COMPENSATOR LINK

OPEN-HEARTH STEEL

SCALE ②

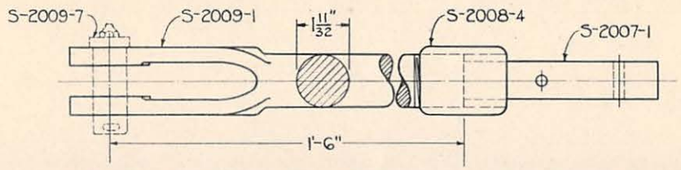


S-2007-4 SOLID JAW WITH THREADED END 2'-6⅝" LONG

S-2007-5 SOLID JAW WITH THREADED END 1'-3" LONG

OPEN-HEARTH STEEL

SCALE ②

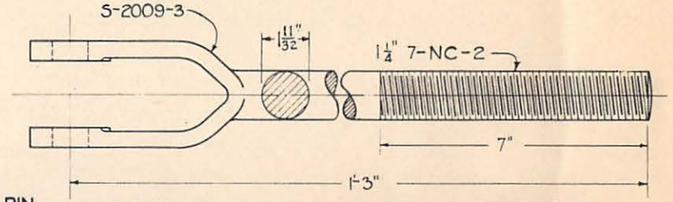


S-2007-6 STRAIGHT SOLID JAW WITH TANG END WITH PIN AND COTTER COMP.

S-2007-7 STRAIGHT SOLID JAW WITH TANG END ONLY

OPEN-HEARTH STEEL

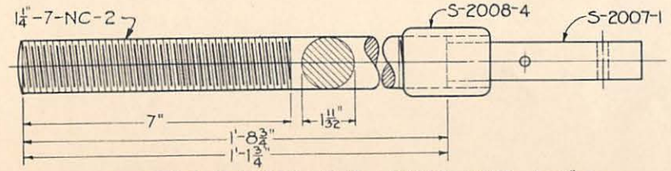
SCALE ②



S-2007-12 WIDE JAW WITH THREADED END

OPEN-HEARTH STEEL

SCALE ②

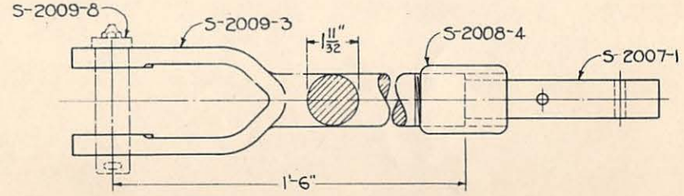


S-2007-8 THREADED TANG END 1'-8¾" LONG

S-2007-9 THREADED TANG END 1'-1¾" LONG

OPEN-HEARTH STEEL

SCALE ②



S-2007-10 WIDE JAW WITH TANG END WITH PIN AND COTTER COMP.

S-2007-11 WIDE JAW WITH TANG END ONLY

OPEN-HEARTH STEEL

SCALE ②

SCALE IN INCHES

① 0 1 2 3 6 12

② 0 ½ 1 2 3 4 5 6

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Brooks, VICE PRESIDENT		
ERIE RAILROAD COMPANY — H Woodruff, VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST LOUIS RAILROAD COMPANY — D Brooks, VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — A Bowman, VICE PRESIDENT		
C.B.P. C.S.L.	C.D.M.	A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

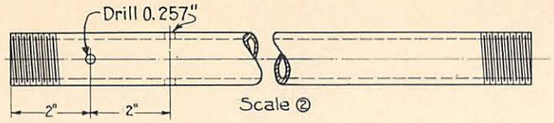
STANDARD
TANG END, LUG, LINK, AND SOLID JAW

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

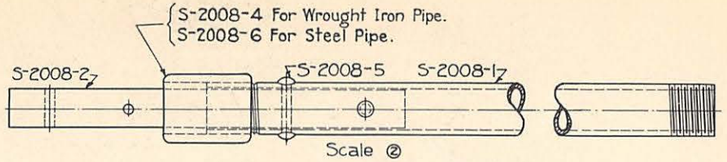
APPROVED: DEC. 13, 1934

C. Ruckel
CHIEF ENGINEER

S-2007-A

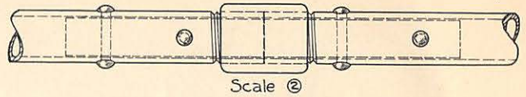


S-2008-1 SIGNAL PIPE

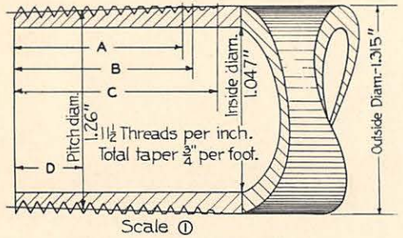


S-2008-3 PIPE SECTION

Assembled for Shipment



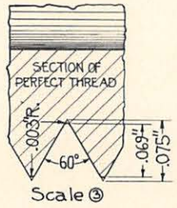
FIELD ASSEMBLY



DETAIL OF THREAD

DETAIL OF THREAD
LEGEND

A — Length of perfect bottom thread, shop practice - 1.0625"
B — Nominal length of thread - 1.125"
C — Length of thread complete, shop practice 1.2797"
D — Length of five threads - 0.4348"

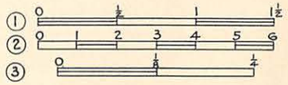


NOTES

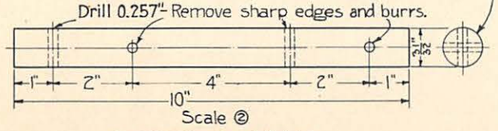
One-inch galvanized welded steel signal pipe shall be in accordance with latest revision of Standard Specifications S-1517, One-Inch Galvanized Welded Steel Signal Pipe.

One-inch welded wrought iron signal pipe shall be in accordance with latest revision of Standard Specifications S-1509, One-Inch Welded Wrought Iron Signal Pipe.

SCALE IN INCHES

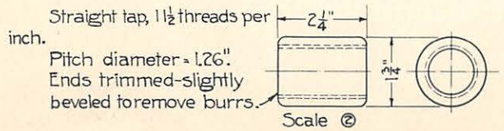


NOTE: Nominal diameter of plug shall be 31/32". Allowable Variation: Minimum 15/16" Maximum 63/64".



S-2008-2 PLUG

OPEN HEARTH STEEL

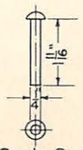


S-2008-4 COUPLING

WROUGHT IRON

S-2008-6 COUPLING

STEEL



S-2008-5 RIVET

WROUGHT IRON

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST LOUIS RAILROAD COMPANY — VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT		
C.S.L.	C.D.M.	A.J.P.
C.S.L.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

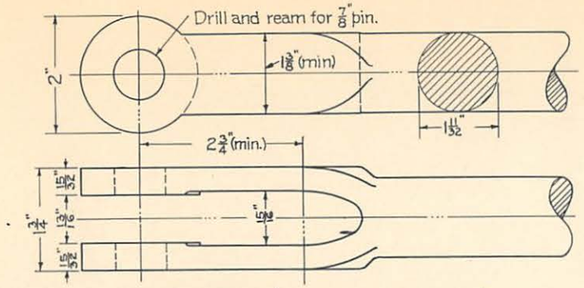
STANDARD
ONE-INCH WELDED SIGNAL PIPE AND COUPLING

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

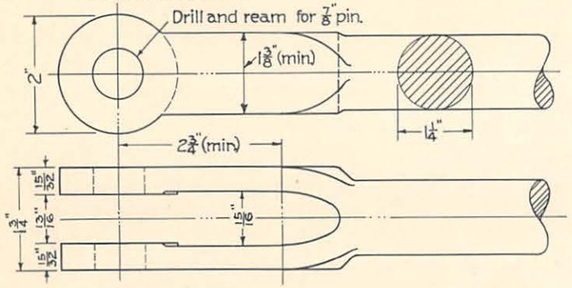
APPROVED MAR. 17, 1931

CHIEF ENGINEER

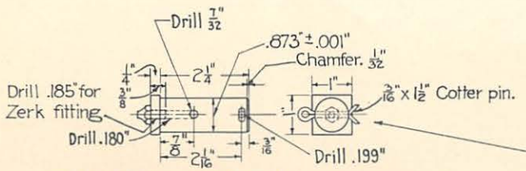
S-2008



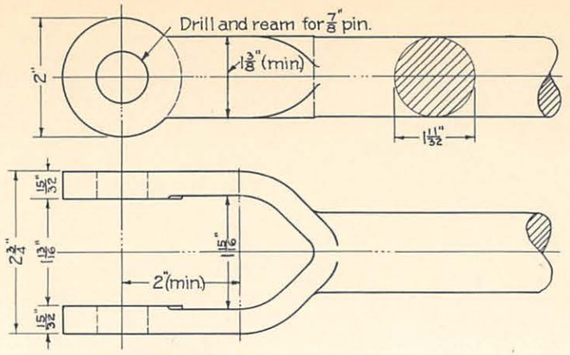
SOLID JAW (DETAIL FOR REFERENCE ONLY)
S-2009-1
(OPEN HEARTH STEEL)



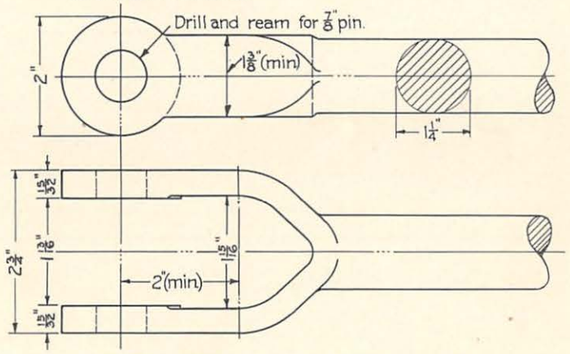
SOLID JAW (DETAIL FOR REFERENCE ONLY)
S-2009-2
(OPEN HEARTH STEEL)



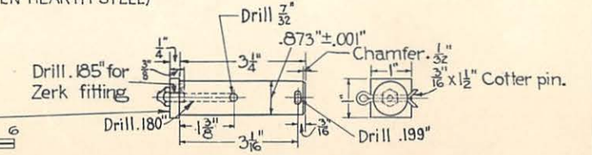
STANDARD JAW PIN (WITH ZERK FITTING)
S-2009-7
(COLD ROLLED STEEL)
STANDARD JAW PIN (ONLY)
S-2009-9



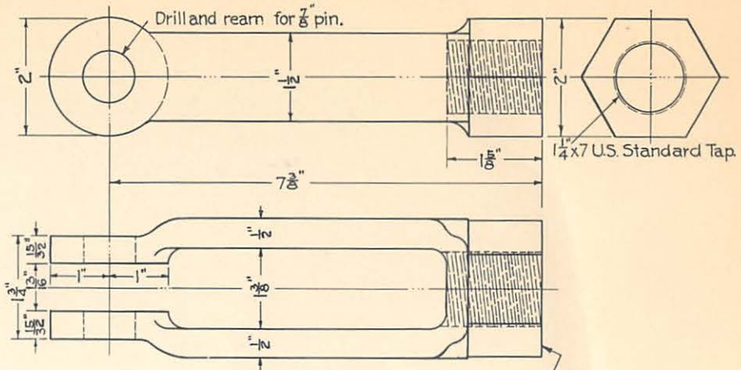
WIDE JAW (DETAIL FOR REFERENCE ONLY)
S-2009-3
(OPEN HEARTH STEEL)



WIDE JAW (DETAIL FOR REFERENCE ONLY)
S-2009-4
(OPEN HEARTH STEEL)

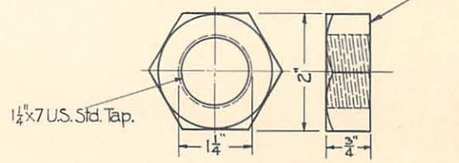


STANDARD WIDE JAW PIN (WITH ZERK FITTING)
S-2009-8
(COLD ROLLED STEEL)
STANDARD WIDE JAW PIN (ONLY)
S-2009-10



SCREW JAW
S-2009-5
(OPEN HEARTH STEEL)

Finish to give plane face.



JAM NUT
S-2009-6
(COLD PUNCHED)

SCALE IN INCHES
0 1 2 3 4

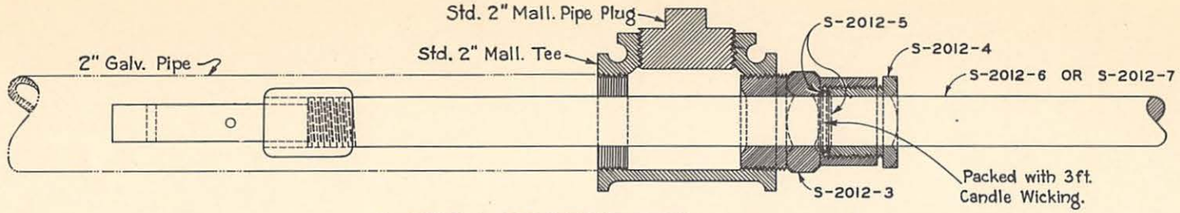
APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST LOUIS RAILROAD COMPANY — VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT		
C.B.P. C.S.L.	C.D.M.	A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD PIPE JAW DETAILS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: MAR. 17, 1931
CHIEF ENGINEER

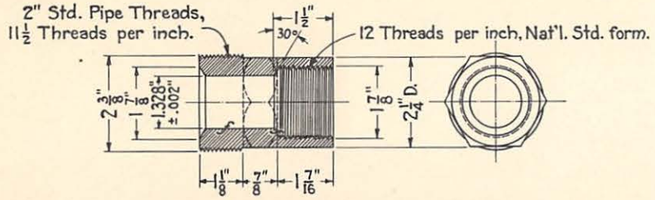
S-2009



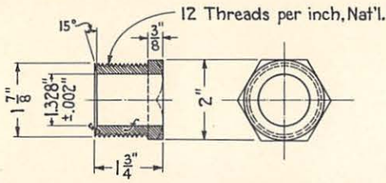
S-2012-1 STUFFING BOX COMPLETE WITH S-2012-6
S-2012-2 STUFFING BOX COMPLETE WITH S-2012-7

NOTES

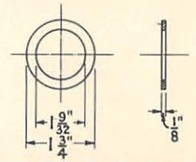
1. EITHER COLD ROLLED STEEL FINISH OR GROUND FINISH WILL BE SATISFACTORY.
2. COUPLINGS AND ONE INCH (1") PIPE THREADS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1509, ONE-INCH WROUGHT IRON SIGNAL PIPE.



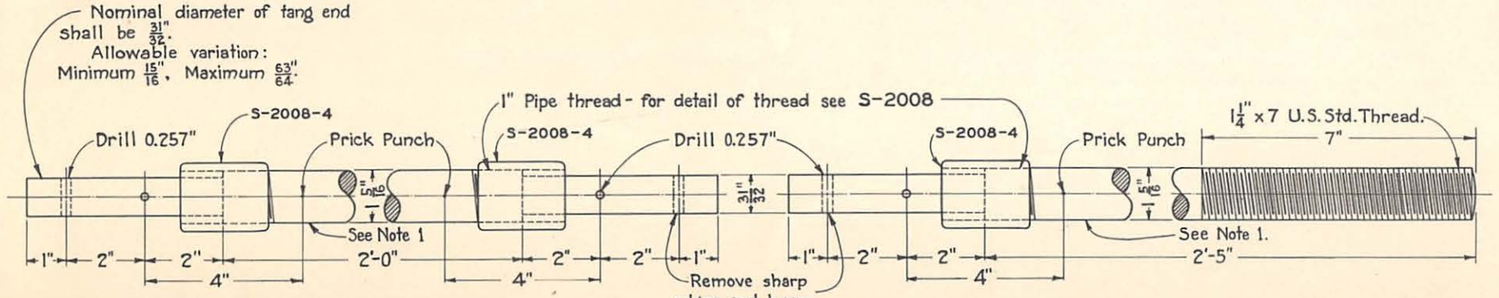
S-2012-3 EXTENSION GLAND
MALLEABLE IRON



S-2012-4 BUSHING
CAST BRASS



S-2012-5 GASKET
LEATHER



S-2012-6 PLUNGER WITH TANG ENDS
COLD ROLLED STEEL

S-2012-7 PLUNGER WITH TANG AND THREADED ENDS
COLD ROLLED STEEL

SCALE IN INCHES
0 1 2 3 4 5 6

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D. Brooks VICE PRESIDENT

ERIE RAILROAD COMPANY
H. E. Woodruff VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
A. Stein VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A. J. Bowman VICE PRESIDENT

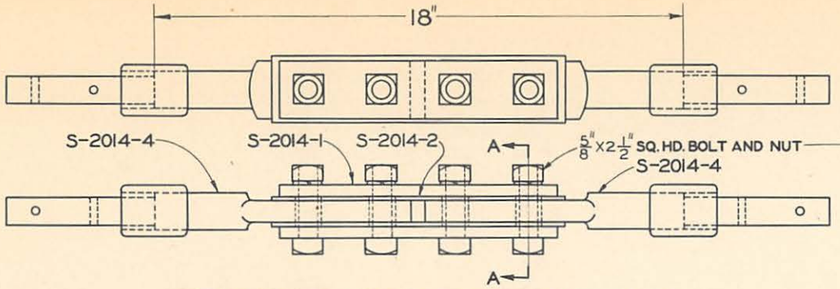
C.B.P. C.B.P. | C.D.M. | A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

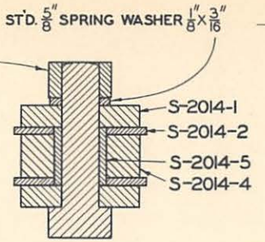
STANDARD STUFFING BOX FOR ONE INCH PIPE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E. H. Bunnell CHIEF ENGINEER APRIL 21, 1931

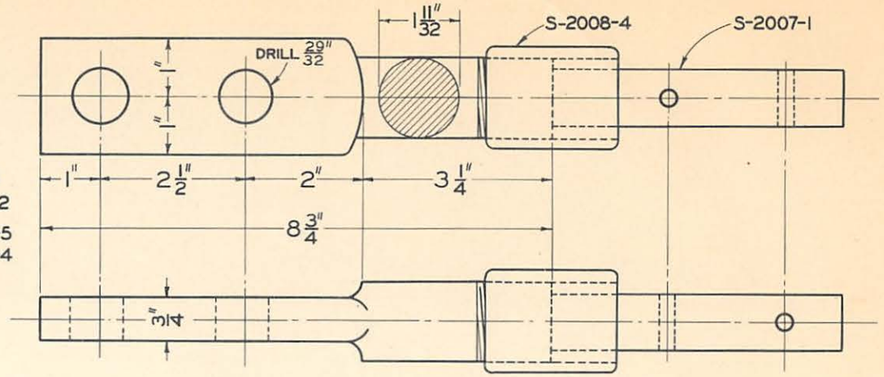
S-2012



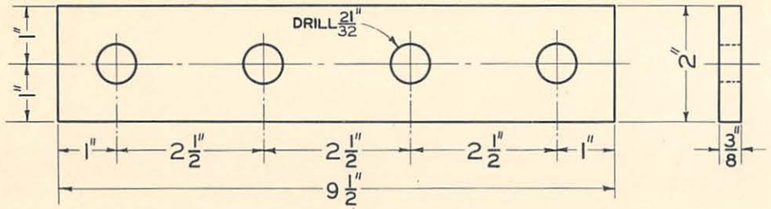
S-2014-6 PIPE LINE INSULATION COMPLETE
SCALE (1)



SECTION A-A
SCALE (2)



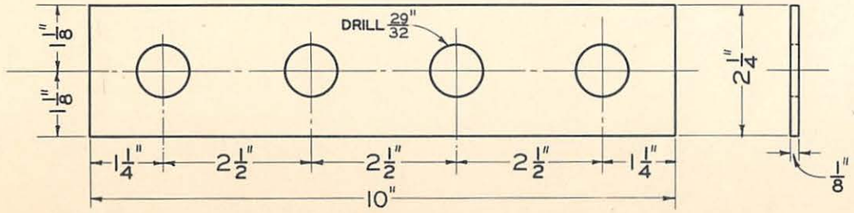
S-2014-3 TANGED END PLATE ONLY
S-2014-4 TANGED END PLATE WITH S-2008-4 COMPLETE
O-H. STEEL
SCALE (2)



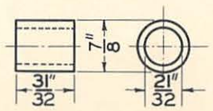
S-2014-1 SPLICE PLATE
O-H. STEEL
SCALE (2)

NOTES
1. FIBRE SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1516, HARD FIBRE.
2. ALL METAL PARTS, EXCEPT THREADS, SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
(1) 0 1 2 3 4 5 6 7 8
(2) 0 1 2 3 4



S-2014-2 INSUPLATION PLATE
FIBRE
SCALE (2)



S-2014-5 INSULATION BUSHING
FIBRE
SCALE (2)

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

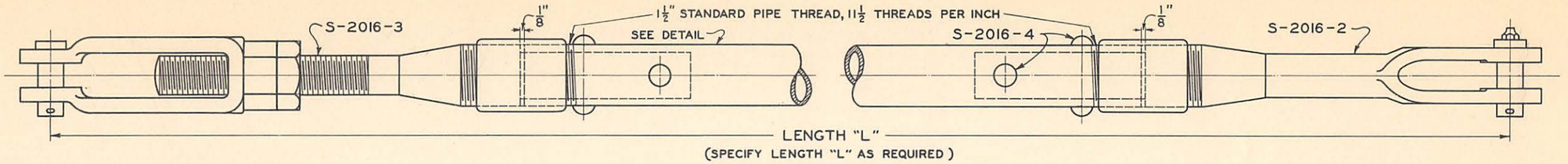
K.L.M.	C.D.M.	A.J.P.
K.L.M.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

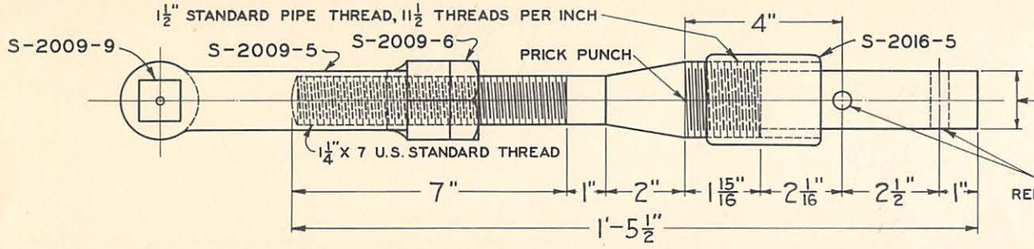
STANDARD PIPE LINE INSULATION

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JULY 22, 1931
CHIEF ENGINEER

S-2014

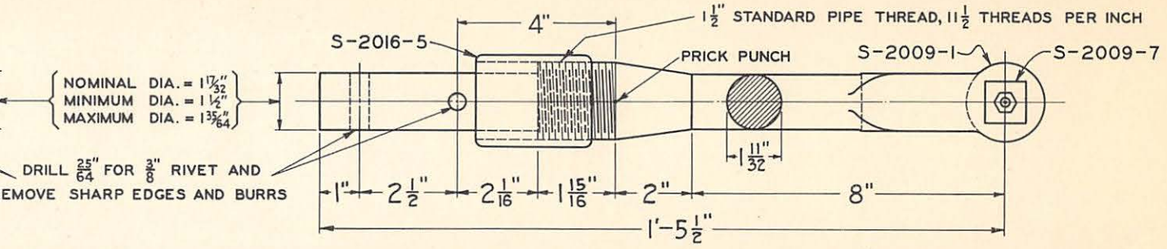


S-2016-1 DOWN ROD COMPLETE FOR ROCKING SHAFT AND VERTICAL CRANK LEADOUTS



S-2016-3 SCREW JAW COMPLETE, TANGED FOR 1½" STD. PIPE

FORGED STEEL

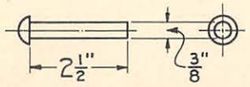


S-2016-2 SOLID JAW COMPLETE, TANGED FOR 1½" STD. PIPE

FORGED STEEL

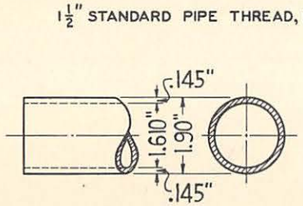
SCALE IN INCHES

0 1 2 3 4 5 6



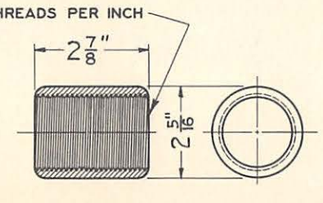
S-2016-4 RIVET

WROUGHT IRON



1½ INCH PIPE SECTION

STEEL OR WROUGHT IRON



S-2016-5 COUPLING

WROUGHT IRON

NOTE

ALL PARTS EXCEPT THREADS, BEARING SURFACES AND PIN HOLES SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D. Brooks VICE PRESIDENT

ERIE RAILROAD COMPANY
H. E. Woodruff VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
J. H. Beem VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
J. H. Bowman VICE PRESIDENT

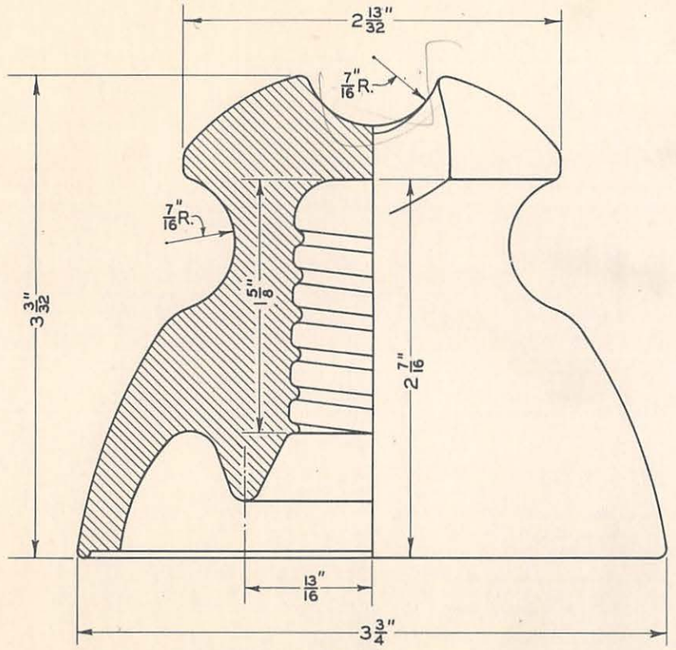
C. H. W. C. B. P.	C. D. M.	A. J. P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

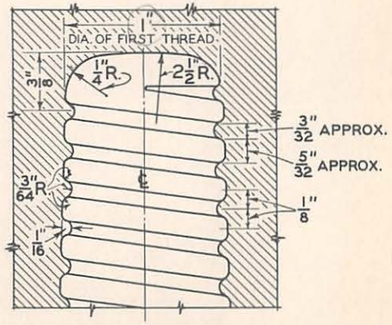
STANDARD DOWN ROD

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: A. M. Richel CHIEF ENGINEER APRIL 21, 1931

S-2016



S-2021-1 INSULATOR FOR 440 TO 6600 VOLTS



DETAIL OF THREAD IN INSULATOR

NOTES

1. INSULATOR SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1550, PIN TYPE GLASS INSULATOR FOR 440 TO 6600 VOLT POWER LINE FOR SIGNAL PURPOSES.
2. TOLERANCE, EXCEPT THREAD: MAXIMUM 3%, MINIMUM AS DIMENSIONED ON PLAN.

SCALE IN INCHES

0 1/2 1 1 1/2

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT		
K.L.M.	C.D.M.	A.J.P.
K.L.M.		

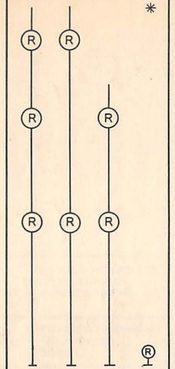
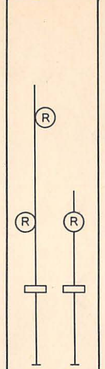
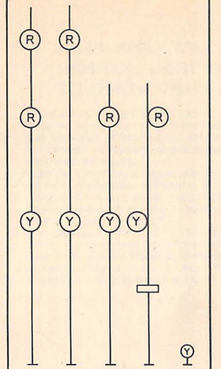
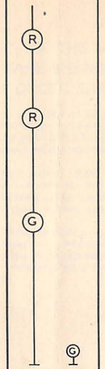
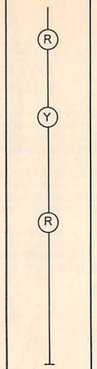
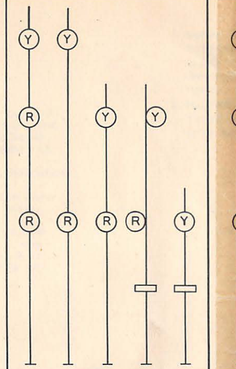
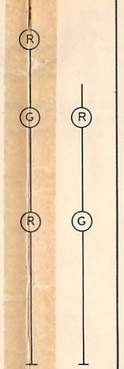
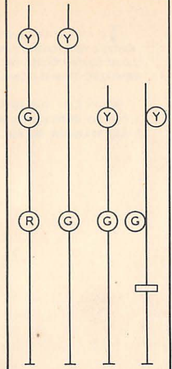
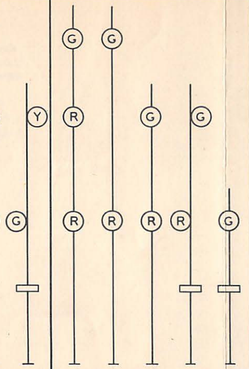
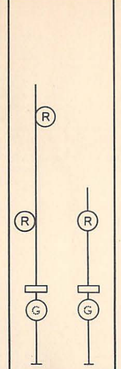
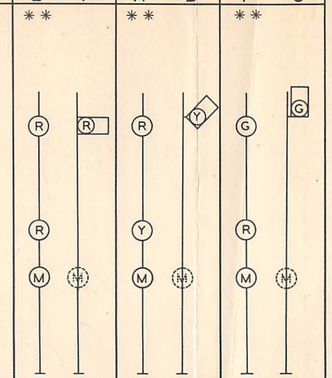
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD PIN TYPE GLASS INSULATOR FOR 440 TO 6600 VOLTS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: APRIL 18, 1933.
CHIEF ENGINEER

S-2021

S-2024-A

	INTERLOCKING AND AUTOMATIC																				MANUAL BLOCK					
RULE	292				291		290					287		286	285				283		282				281					292		289		281	
FIGURE	A	B	C	D	A	B	A	B	C	D	E	A	B	A	A	B	C	D	E	A	C	A	B	C	D	A	B	C	D	E	A	B	E	F	A	B	F	G
ASPECTS																																									
INDICATION	STOP.				STOP; THEN PROCEED.		PROCEED AT RESTRICTED SPEED.					PROCEED AT NOT EXCEEDING SLOW SPEED.		PROCEED AT NOT EXCEEDING MEDIUM SPEED PREPARED TO STOP AT NEXT SIGNAL.	PREPARE TO STOP AT NEXT SIGNAL. TRAIN EXCEEDING MEDIUM SPEED MUST AT ONCE REDUCE TO THAT SPEED.				PROCEED AT NOT EXCEEDING MEDIUM SPEED.		APPROACH NEXT SIGNAL AT NOT EXCEEDING MEDIUM SPEED.				PROCEED.					FREIGHT TRAINS PROCEED AT RESTRICTED SPEED WITHOUT STOPPING EXPECTING TO FIND A TRAIN IN THE BLOCK, BROKEN RAIL, OBSTRUCTION, OR SWITCH NOT PROPERLY SET. NOTE: MARKER SHALL BE A YELLOW DISC WITH OR WITHOUT THE LETTER "G."		STOP.		BLOCK OCCUPIED; PROCEED PREPARED TO STOP SHORT OF TRAIN AHEAD.		PROCEED; BLOCK CLEAR.	
NAME	STOP.				STOP AND PROCEED.		RESTRICTING.					CLEAR SLOW.		MEDIUM APPROACH.	APPROACH.				CLEAR MEDIUM.		APPROACH MEDIUM.				CLEAR.					GRADE.		STOP.		PERMISSIVE.		CLEAR.	

NOTES

* RULE 292 D - PURPLE MAY BE USED.

** 292 E, 289 A, AND 281 F COLOR LIGHT MANUAL BLOCK SIGNALS ARE SHOWN HERE, MAKING THEM AVAILABLE FOR USE AT SUCH LOCATIONS AS THE FOLLOWING:

1. AT INTERLOCKING IN MANUAL BLOCK TERRITORY.
2. AT END OF AUTOMATIC SIGNAL TERRITORY AND ENTRANCE INTO MANUAL BLOCK TERRITORY.
3. AT OTHER POINTS WHERE MECHANICAL CONNECTIONS TO SIGNAL ARE UNDESIRABLE.

LEGEND

R - RED
Y - YELLOW
G - GREEN
▭ - NUMBER PLATE

NOTES

1. MARKER SHALL BE A WHITE DISC WITH A BLACK LETTER "M."
2. MARKER SHALL BE APPLIED TO SEMAPHORE MANUAL BLOCK SIGNAL GOVERNING MOVEMENTS FROM AUTOMATIC SIGNAL TERRITORY TO MANUAL BLOCK TERRITORY.

NO SCALE

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — PRESIDENT

K.L.M. K.L.M. C.D.M. W.S.E.

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ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD SIGNAL ASPECTS AND INDICATIONS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

CHAIRMAN

JUNE 28, 1944

S-2024-A

RULE	1	2	3
FIGURE	A	A	A
ASPECT			
INDICATION	STOP ON MAIN TRACK AND REPORT FOR INSTRUCTIONS.	TAKE SIDING AND WHEN CLEAR OF MAIN TRACK REPORT FOR INSTRUCTIONS.	PROCEED REGARDLESS OF FOLLOWING SUPERIOR TRAINS.
NAME	STOP TELEPHONE TRAIN ORDER SIGNAL.	TAKE SIDING TELEPHONE TRAIN ORDER SIGNAL.	PROCEED TELEPHONE TRAIN ORDER SIGNAL.

RULES APPLICABLE TO THE USE OF POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER SIGNALS

1. WHEN AN AUTOMATIC BLOCK SIGNAL LOCATED AT OR NEAR THE ENTRANCE OF A SIDING INDICATES "STOP THEN PROCEED", A TRAIN WHICH IS TO TAKE SIDING MAY PROCEED AT RESTRICTED SPEED, WITHOUT STOPPING, INTO THE SIDING. OTHERWISE, AUTOMATIC BLOCK SIGNAL INDICATIONS SHALL BE OBSERVED AS PROVIDED BY RULES.
2. POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER SIGNAL INDICATIONS DO NOT SUPERSEDE AUTOMATIC BLOCK SIGNAL INDICATIONS.
3. PERMISSION SHALL BE OBTAINED BEFORE USING CROSSOVER BETWEEN MAIN TRACKS WHERE A POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER SIGNAL IS LOCATED.
4. IT IS FORBIDDEN TO ACCEPT THE PROCEED INDICATION OF RULE 3, FIG. A, IF THERE IS ANY KNOWN CONDITION THAT WILL PREVENT MAKING USUAL RUNNING TIME. WHEN A TRAIN ACCEPTS THE PROCEED INDICATION OF RULE 3, FIG. A, AND IS UNABLE TO MAKE USUAL RUNNING TIME THE TRAIN MUST BE PROTECTED AS PRESCRIBED BY RULE 99.

NOTES

1. SIGNAL UNITS SHALL BE EQUIPPED WITH A $5\frac{3}{8}$" INVERTED TORIC LENS SUPPLEMENTED BY A COVER GLASS OF NONGLARING COMPOSITION WHICH SHALL GIVE THE TRANSMITTED LIGHT A SLIGHT YELLOWISH TINGE.
2. POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER SIGNAL MAY BE LOCATED ON MAST WITH AUTOMATIC SIGNAL OR ON SEPARATE MAST.

NO SCALE

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

K. L. M. | C. B. P. | C. D. M. | A. J. P.

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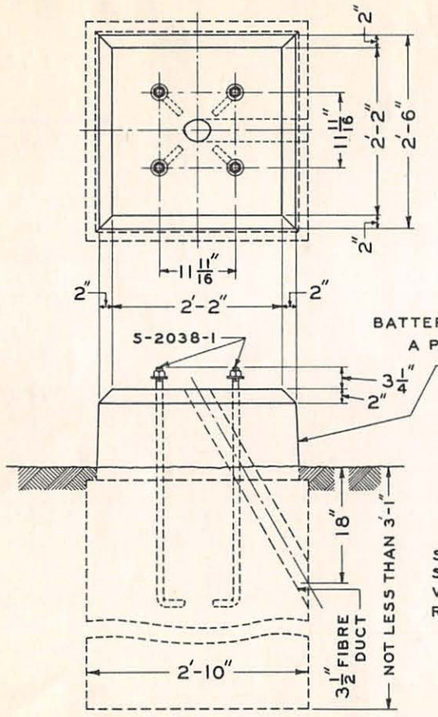
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

ASPECTS AND INDICATIONS FOR POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

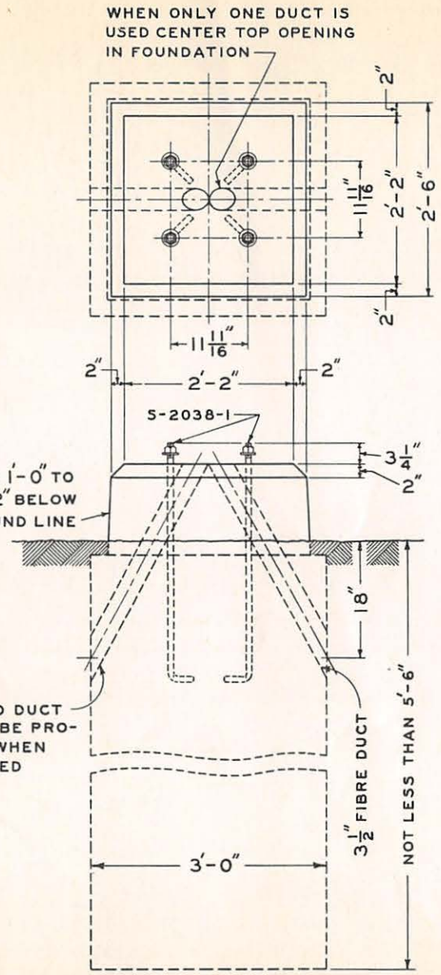
APPROVED: APRIL 21, 1936.
CHIEF ENGINEER



S-2029-1 ONE UNIT

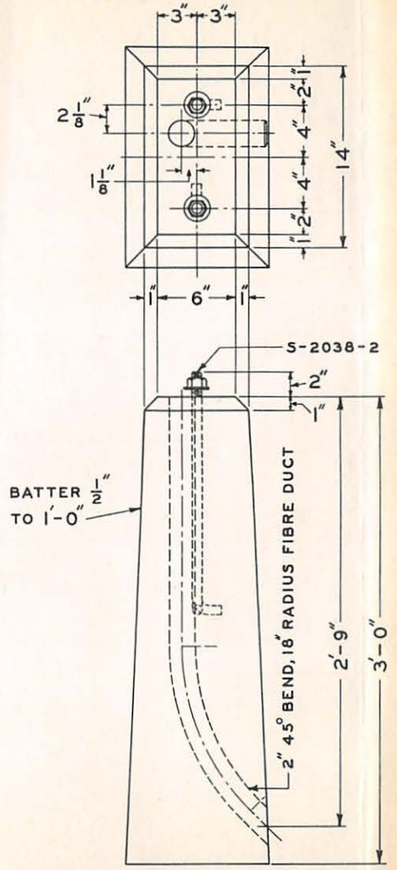
APPROXIMATE CONCRETE 31 CU. FT.

STONE IN AGGREGATE SHALL NOT EXCEED 1 1/2"



S-2029-2 TWO AND THREE UNIT

APPROXIMATE CONCRETE 55 CU. FT.



S-2029-3 DWARF

APPROXIMATE CONCRETE 3.75 CU. FT.

STONE IN AGGREGATE SHALL NOT EXCEED 1 1/2"

NOTES

1. FIBRE DUCT SHALL BE USED AS REQUIRED DEPENDING UPON LOCAL CONDITIONS.
2. TOP OF FOUNDATIONS FOR ONE, TWO, AND THREE UNIT SIGNALS SHALL BE SET LEVEL WITH TOP OF RAIL. TOP OF FOUNDATION FOR DWARF SIGNALS SHALL NOT BE SET BELOW THE TOP OF RAIL.
3. PRECAST FOUNDATIONS SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 2500 POUNDS PER SQUARE INCH. WHEN CAST IN THE FIELD, THE PROPORTIONS, IF BY LOOSE VOLUME MEASUREMENT OF AGGREGATES, SHALL BE AS FOLLOWS:

SIZE OF STONE	MINIMUM BAGS OF CEMENT PER CUBIC YARD OF CONCRETE	APPROXIMATE MIX PROPORTIONS
LARGER THAN 1"	6.0	1 – 2 1/2 – 3 1/2
BETWEEN 3/4" AND 1"	6.5	1 – 2 1/2 – 3
SMALLER THAN 3/4"	7.0	1 – 2 1/2 – 2 1/2

ONLY SUFFICIENT WATER SHALL BE USED TO OBTAIN A WORKABLE CONSISTENCY.

NO SCALE

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
K A Gwinnett
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
H L Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
J M Davin
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
G J Bowman
PRESIDENT

W.S.E.	W.S.E.	W.N.H.

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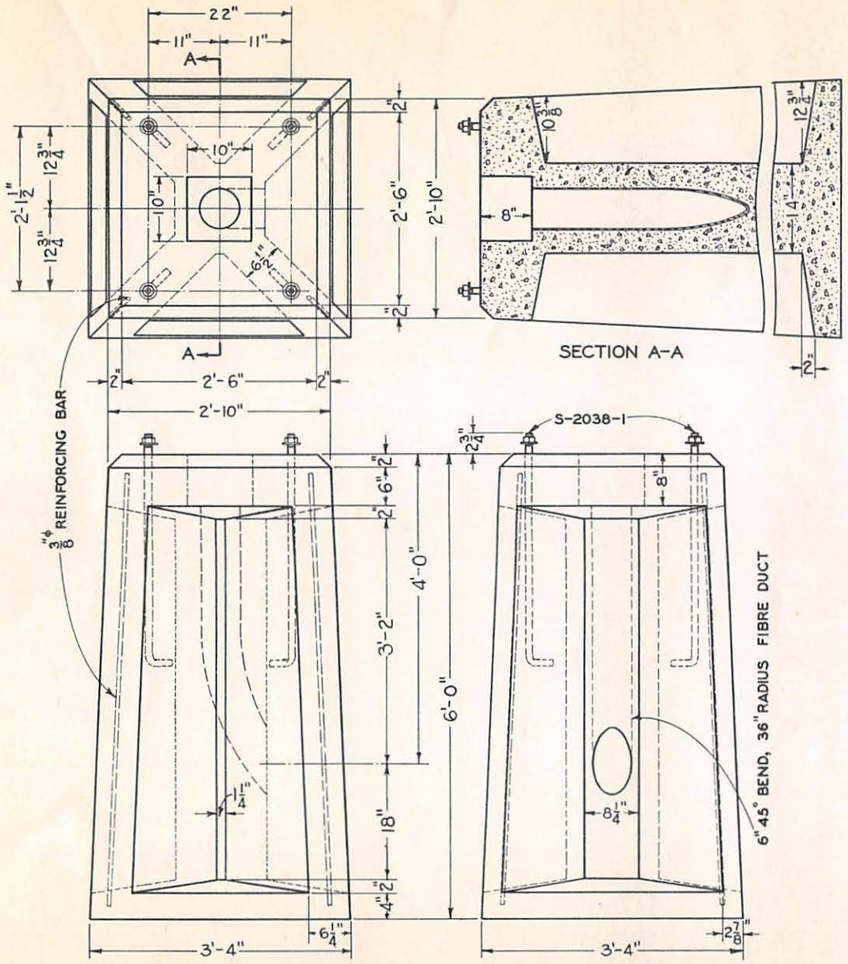
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

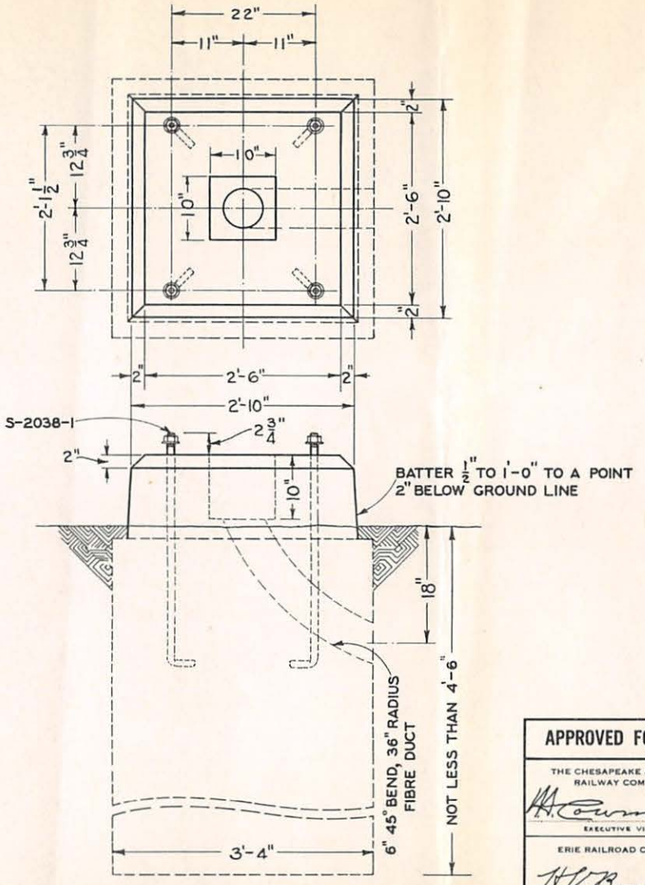
STANDARD COLOR LIGHT SIGNAL FOUNDATIONS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J Wallace
CHAIRMAN
SEPT. 14, 1944

SHEET 1 OF 3
S-2029-A



S-2029-4 PRECAST ONE, TWO, AND THREE UNIT
FOR SIGNAL MOUNTED ON INSTRUMENT CASE
APPROXIMATE CONCRETE 31 CU. FT.
STONE IN AGGREGATE SHALL NOT EXCEED 1½"



S-2029-5 ONE, TWO, AND THREE UNIT
FOR SIGNAL MOUNTED ON INSTRUMENT CASE
APPROXIMATE CONCRETE 56.5 CU. FT.
STONE IN AGGREGATE SHALL NOT EXCEED 1½"

NOTES

1. FIBRE DUCT SHALL BE USED AS REQUIRED DEPENDING UPON LOCAL CONDITIONS.
2. TOP OF FOUNDATIONS SHALL BE SET LEVEL WITH TOP OF RAIL.
3. PRECAST FOUNDATIONS SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 2500 POUNDS PER SQUARE INCH. WHEN CAST IN THE FIELD, THE PROPORTIONS, IF BY LOOSE VOLUME MEASUREMENT OF AGGREGATES, SHALL BE AS FOLLOWS:

SIZE OF STONE	MINIMUM BAGS OF CEMENT PER CUBIC YARD OF CONCRETE	APPROXIMATE MIX PROPORTIONS
LARGER THAN 1"	6.0	1 — 2½ — 3½
BETWEEN ¾" AND 1"	6.5	1 — 2½ — 3
SMALLER THAN ¾"	7.0	1 — 2½ — 2½

ONLY SUFFICIENT WATER SHALL BE USED TO OBTAIN A WORKABLE CONSISTENCY.

NO SCALE

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H. H. Courmaster
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
H. H. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
J. M. Davis
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
J. H. Bowman
PRESIDENT

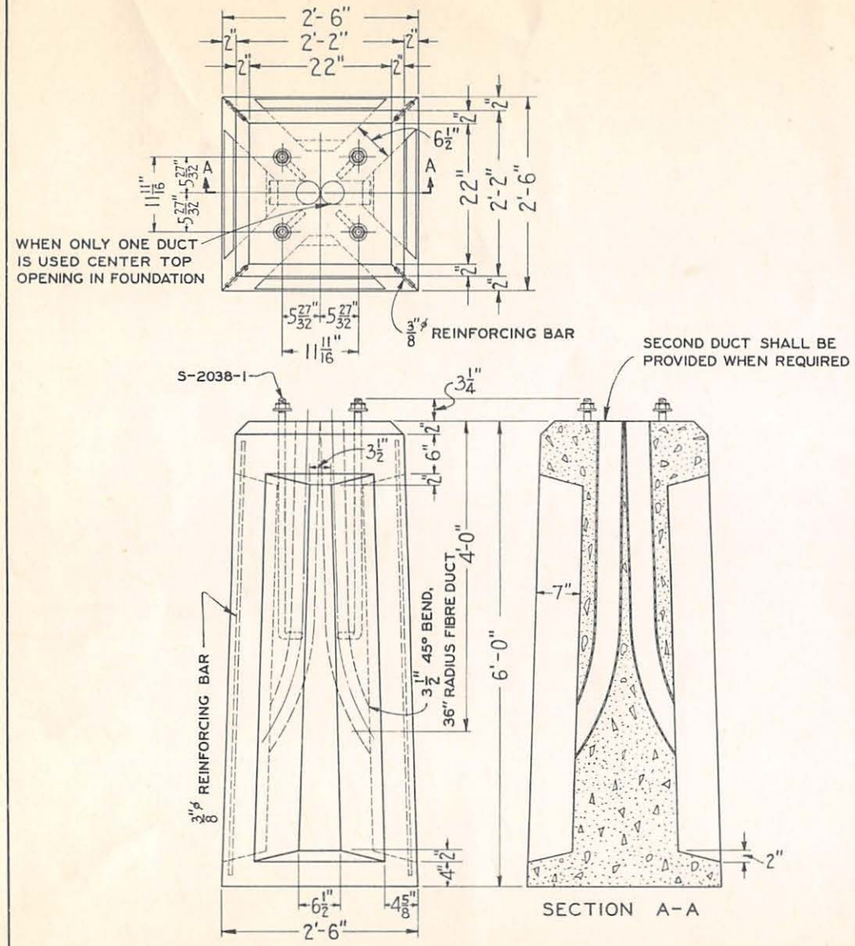
C.B.P.	W.S.E.	W.N.H.
C.S.L.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD COLOR LIGHT SIGNAL FOUNDATIONS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. E. Wallace
CHAIRMAN
SEPT. 14, 1944

SHEET 2 OF 3
S-2029-A



S-2029-6 PRECAST ONE, TWO, AND THREE UNIT

APPROXIMATE CONCRETE 23 CU. FT.
STONE IN AGGREGATE SHALL NOT EXCEED 1½"

NOTES

1. FIBRE DUCT SHALL BE USED AS REQUIRED DEPENDING UPON LOCAL CONDITIONS.
2. TOP OF FOUNDATIONS SHALL BE SET LEVEL WITH TOP OF RAIL.
3. FOUNDATIONS SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 2500 POUNDS PER SQUARE INCH.

SCALE IN FEET
0 1 2 3

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H. Commaster
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
H. D. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
J. W. Davis
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
R. H. Bowman
PRESIDENT

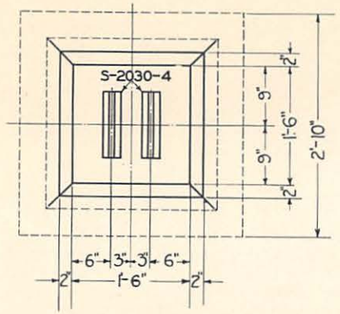
C. S. L.	W. S. E.	W. N. H.
C. B. P.		

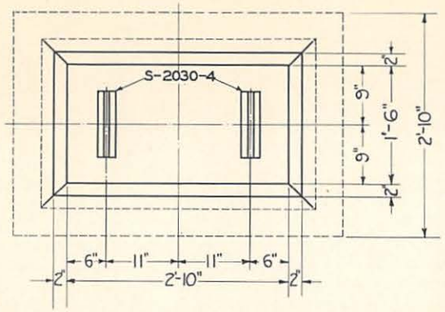
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

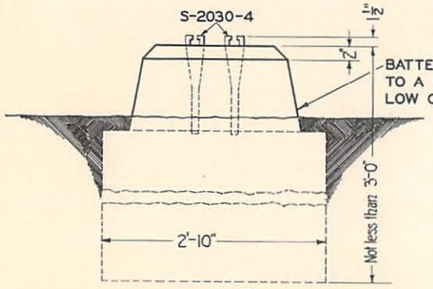
STANDARD COLOR LIGHT SIGNAL FOUNDATIONS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
SEPT. 14, 1944
J. Kurrelmeyer
CHAIRMAN

SHEET 3 OF 3
S-2029-A





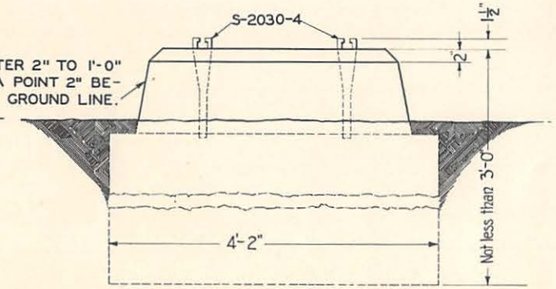


SCALE ③

S-2030-1 HORIZONTAL CRANK

STONE IN CONCRETE NOT TO BE LARGER THAN 1½"

APPROXIMATE CONCRETE 20. CU. FT.

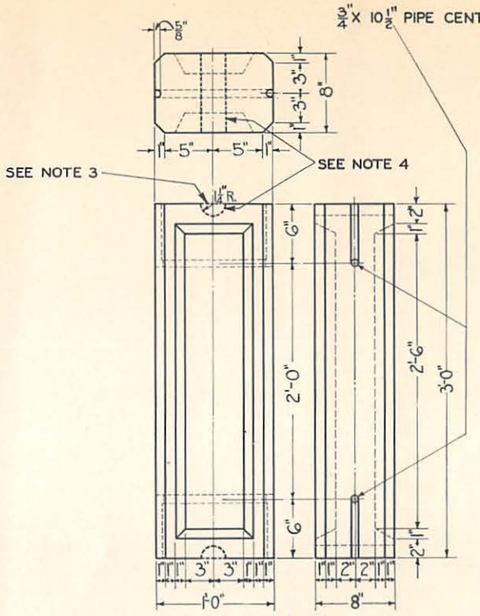


SCALE ③

S-2030-2 COMPENSATOR

STONE IN CONCRETE NOT TO BE LARGER THAN 1½"

APPROXIMATE CONCRETE 30. CU. FT.

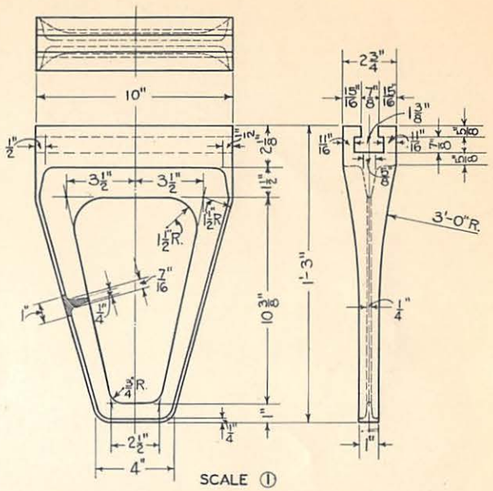


SCALE ②

S-2030-3 PIPE CARRIER See Note 3
S-2030-5 AIR LINE See Note 4

STONE IN CONCRETE NOT TO BE LARGER THAN ¾"

APPROXIMATE CONCRETE 2 CU. FT.



SCALE ①

S-2030-4 ANCHOR POST

CAST IRON

SCALE IN INCHES

① 0 1 2 3 4 8 12

SCALE IN FEET

② 0 1 2

③ 0 1 2 3

NOTES:

1. Pre-cast foundations shall be built with compression strength of 2500 pounds in accordance with latest revision of standard specifications R-5.
2. Foundations poured in field shall have mixture of 1-2-4.
3. Top and bottom of Pipe Carrier Foundation to be flat.
4. Top and bottom of Air Line Foundation to be grooved, using 1¼" radius.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT

ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

C.S.L.	C.D.M.	A.J.P.
C.S.L.		

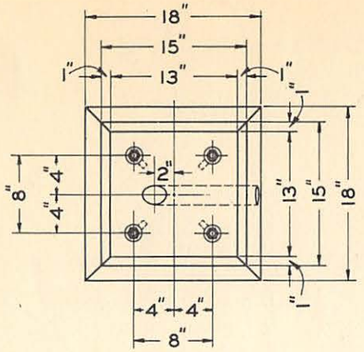
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

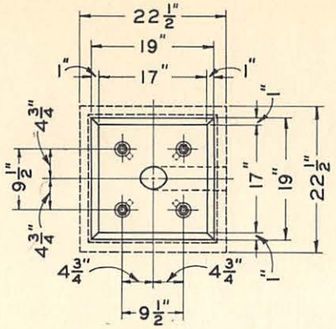
STANDARD CRANK, COMPENSATOR, PIPE CARRIER AND AIR LINE FOUNDATIONS

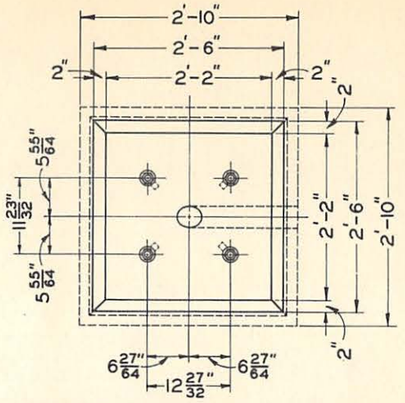
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

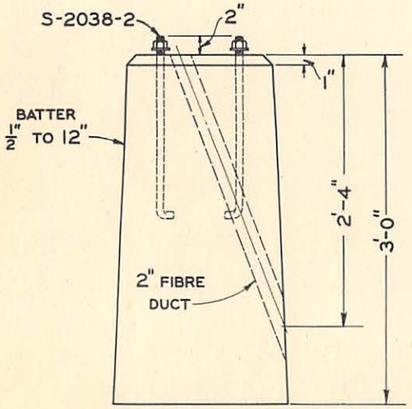
APPROVED: CHIEF ENGINEER — MAR. 17, 1931

S-2030







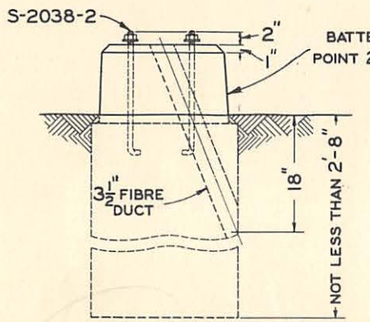


S-2031-1 SEARCHLIGHT DWARF SIGNAL FOUNDATION

APPROXIMATE CONCRETE 5.7 CU. FT.

STONE IN AGGREGATE SHALL NOT EXCEED 1½"

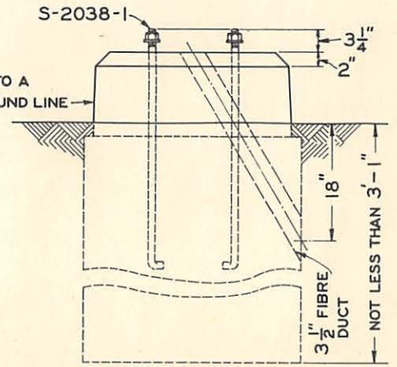
DWARF SIGNAL MOUNTED ON THIS FOUNDATION SHOULD BE EQUIPPED WITH 1½" FLEX. STEEL BOX CONNECTOR



S-2031-2 CABLE POST OR FLASHING CROSSING SIGNAL FOUNDATION

APPROXIMATE CONCRETE 12 CU. FT.

STONE IN AGGREGATE SHALL NOT EXCEED 1½"



S-2031-3 CROSSING SIGNAL FOUNDATION FOR TYPE DW WIGWAG

APPROXIMATE CONCRETE 31 CU. FT.

STONE IN AGGREGATE SHALL NOT EXCEED 1½"

NOTES

1. FIBRE DUCT SHALL BE USED AS REQUIRED DEPENDING UPON LOCAL CONDITIONS.
2. TOP OF FOUNDATION S-2031-1 FOR SEARCHLIGHT DWARF SIGNAL SHALL NOT BE SET BELOW THE TOP OF RAIL.
3. FOUNDATION S-2031-2 WHEN USED WITH CABLE POST SHALL BE SET WITH TOP OF FOUNDATION LEVEL WITH TOP OF RAIL WHEN PRACTICABLE.
4. FOUNDATION S-2031-2, WHEN USED WITH CROSSING SIGNAL, AND FOUNDATION S-2031-3 SHALL BE SET WITH TOP OF FOUNDATION NOT LESS THAN 6" ABOVE GROUND LINE.
5. PRECAST FOUNDATIONS SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 2500 POUNDS PER SQUARE INCH. WHEN CAST IN THE FIELD, THE PROPORTIONS, IF BY LOOSE VOLUME MEASUREMENT OF AGGREGATES, SHALL BE AS FOLLOWS:

SIZE OF STONE	MINIMUM BAGS OF CEMENT PER CUBIC YARD OF CONCRETE	APPROXIMATE MIX PROPORTIONS
LARGER THAN 1"	6.0	1—2½—3½
BETWEEN ¾" AND 1"	6.5	1—2½—3
SMALLER THAN ¾"	7.0	1—2½—2½

ONLY SUFFICIENT WATER SHALL BE USED TO OBTAIN A WORKABLE CONSISTENCY.

NO SCALE

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
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VICE PRESIDENT

ERIE RAILROAD COMPANY
R. E. Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
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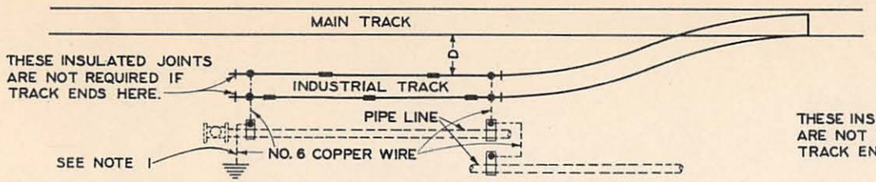
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD CABLE POST, CROSSING SIGNAL, AND SEARCHLIGHT DWARF SIGNAL FOUNDATIONS

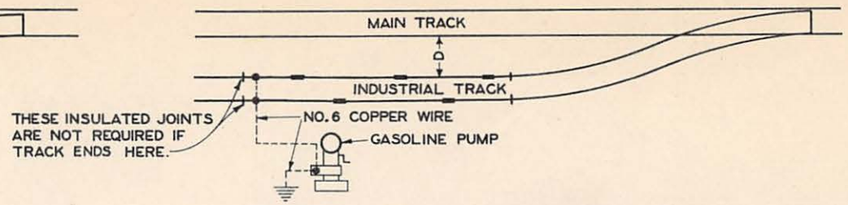
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: W. W. Mitchell FEB. 20, 1934.
CHIEF ENGINEER

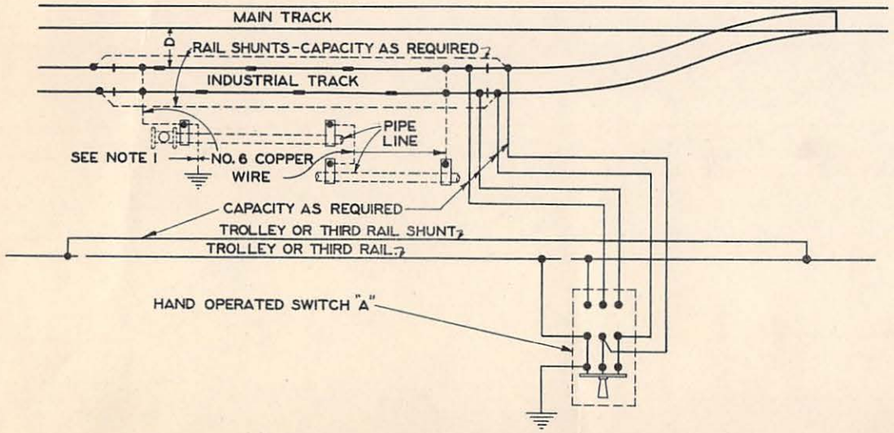
S-2031



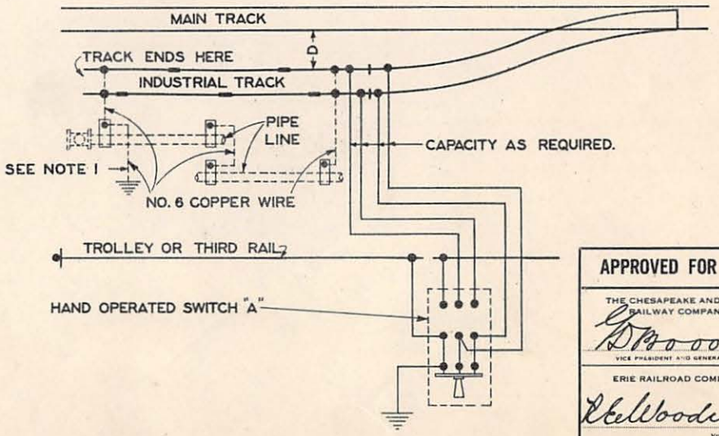
S-2033-1 FOR LOADING OR UNLOADING TRACKS NOT IN ELECTRIFIED TERRITORY



S-2033-2 FOR ALL FILLING STATIONS SERVING RAIL MOTOR COACHES AND INTERNAL COMBUSTION LOCOMOTIVES.



S-2033-3 FOR LOADING OR UNLOADING TRACKS IN ELECTRIFIED TERRITORY, ELECTRIFIED BEYOND THE PROTECTED POINT.



S-2033-4 FOR LOADING OR UNLOADING STUB TRACKS IN ELECTRIFIED TERRITORY.

NOTES

1. GROUND SHOWN IN S-2033-1, -3, AND -4 SHALL BE CONNECTED DIRECT TO RAIL WHEN PIPE IS NOT USED.
2. WHERE PIPE CONNECTED DERAIL IS USED, PIPE LINE SHALL BE INSULATED.
3. CONNECTIONS OF COPPER WIRE TO PIPE LINE SHALL BE PERMANENTLY SOLDERED OR BRAZED TO AN EXPOSED SECTION OF THE PIPE.
4. HAND OPERATED SWITCH "A" SHALL BE EITHER AN AIR BREAK OR OIL TYPE, THREE POLE, DOUBLE THROW, ENCLOSED SAFETY SWITCH WITH LOCKING DEVICE FOR LOCKING IN BOTH POSITIONS; CAPACITY AS REQUIRED, BUT NOT LESS THAN 100 AMPERES.
5. THE MINIMUM FOR "D", THE DISTANCE FROM NEAR RAIL OF MAIN TRACK TO NEAR RAIL UNDER CENTER OF SPOTTED CAR, SHALL BE AS PRESCRIBED BY STATE LAWS, CITY ORDINANCES, INTERSTATE COMMERCE COMMISSION REGULATIONS, AND NATIONAL BOARD OF FIRE UNDERWRITERS.
6. CARS SPOTTED FOR LOADING OR UNLOADING MUST NOT BRIDGE INSULATED RAIL JOINTS OR BE COUPLED TO CARS OUTSIDE OF THE INSULATED TRACK SECTION AT ANY TIME DURING LOADING OR UNLOADING OPERATIONS.
7. INSULATED JOINTS SHALL BE OF APPROVED TYPE.
8. SECTION 4 OF I.C.C. REGULATIONS PAGE 52, PARAGRAPH 697 (b), REQUIRE THAT EITHER CONSIGNOR OR CONSIGNEE PROVIDE A SUITABLE SIGN FOR MARKING LOADING OR UNLOADING SECTION.
9. BONDING SHALL BE DONE IN ACCORDANCE WITH APPROVED PRACTICE.

LEGEND
— INSULATED JOINT
— BONDED JOINT

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Booth
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
R Kellwoodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
A Blem
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PERE MARQUETTE RAILWAY COMPANY
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C.H.W.	C.D.M.	A.J.P.
K.L.M.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

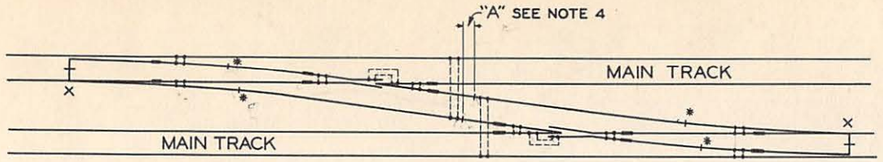
STANDARD

ELECTRICAL PROTECTION ON TRACKS USED FOR LOADING OR UNLOADING INFLAMMABLE LIQUIDS

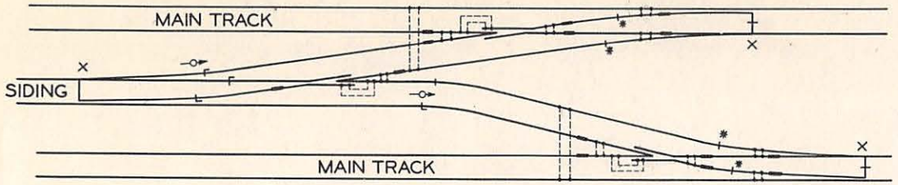
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E Duncan CHIEF ENGINEER OCT. 18, 1932

S-2033

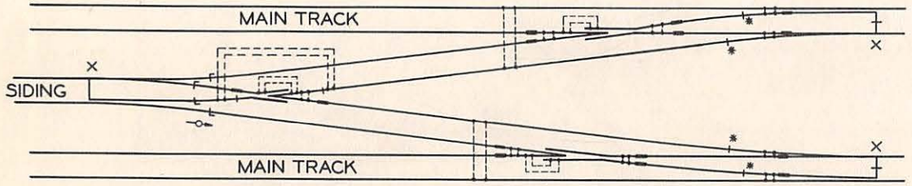
See S-2033-A in Spec Dept.



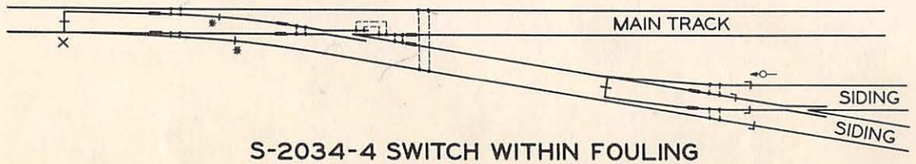
S-2034-1 MAIN TO MAIN CROSSOVER



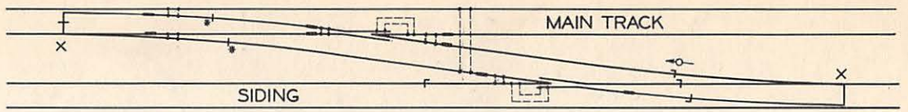
S-2034-2 CENTER SIDING



S-2034-3 CENTER SIDING



S-2034-4 SWITCH WITHIN FOULING



S-2034-5 MAIN TO SIDING CROSSOVER

S-2034-6 SINGLE SWITCH

LEGEND

- BONDED JOINT.
- INSULATED JOINT, TRACK CIRCUIT IN BOTH DIRECTIONS.
- × SWITCH CIRCUIT CONTROLLER LOCATION.
- INSULATED JOINT INDICATING TRACK CIRCUIT ON RIGHT, NONE ON LEFT.
- INSULATED JOINT INDICATING TRACK CIRCUIT ON LEFT, NONE ON RIGHT.

NOTES

1. ALL INSULATED JOINTS AT LOCATIONS MARKED THUS ⊣o⊢ SHALL BE LOCATED TO PROVIDE PROPER CLEARANCE TO TAKE CARE OF EQUIPMENT OVERHANG.
2. NONINTERLOCKED CROSSOVER BETWEEN MAIN TRACKS, ONLY ONE OF WHICH IS TRACK CIRCUITED, SHALL BE INSULATED THE SAME AS CROSSOVER BETWEEN MAIN TRACK AND SIDING.
3. INSULATED JOINTS MARKED THUS * SHALL NOT BE STAGGERED MORE THAN FOUR FEET SIX INCHES (4'-6").
4. FOR CROSSOVER SHORTER THAN No.16, "A" = FOUR FEET SIX INCHES (4'-6") MAXIMUM. FOR CROSSOVER No.16 OR LONGER, "A" = TEN FEET (10'-0") MAXIMUM.

NO SCALE

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Brooke VICE PRESIDENT

ERIE RAILROAD COMPANY
R E Woodruff VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Brooke VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
R H Bowman VICE PRESIDENT

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C. B. P.		

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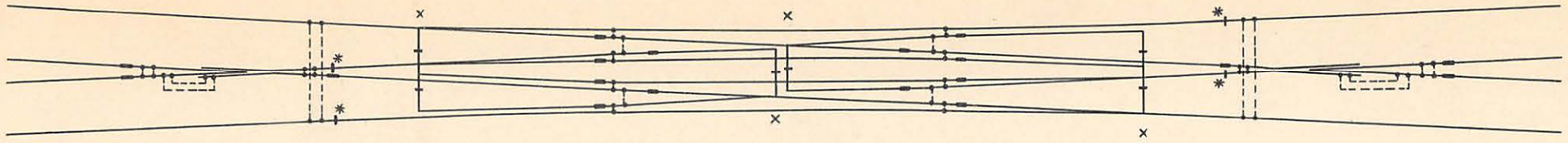
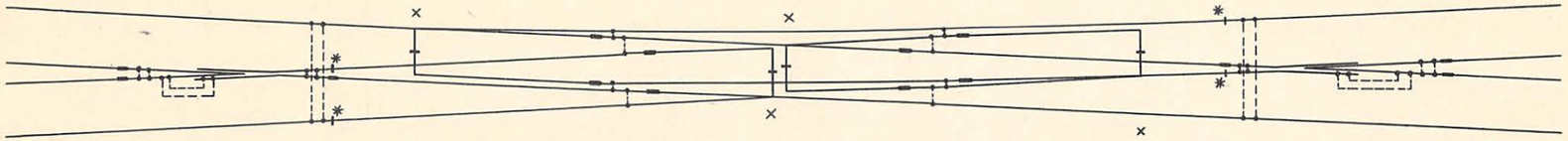
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD FOULING AND BONDING FOR TURNOUTS AND CROSSOVERS

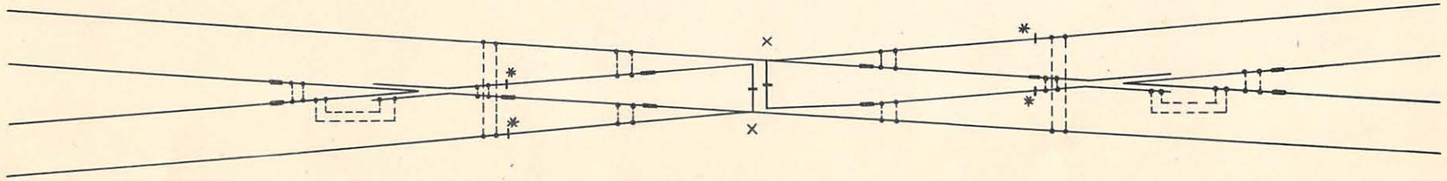
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E T Howson CHIEF ENGINEER JULY 21, 1936



S-2035-1 DOUBLE SLIP SWITCHES AND MOVABLE POINT FROGS



S-2035-2 SINGLE SLIP SWITCHES AND MOVABLE POINT FROGS



S-2035-3 MOVABLE POINT FROGS

NOTE

INSULATED JOINTS MARKED THUS (*) SHALL NOT BE STAGGERED MORE THAN FOUR FEET SIX INCHES (4'- 6").

LEGEND

- BONDED JOINT.
- INSULATED JOINT, TRACK CIRCUIT IN BOTH DIRECTIONS.
- × SWITCH CIRCUIT CONTROLLER LOCATION.

APPROVED FOR USE
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT AND GENERAL MANAGER
ERIE RAILROAD COMPANY — VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

C.H.W.	C. D.M.	A. J. P.
C.H.W.		

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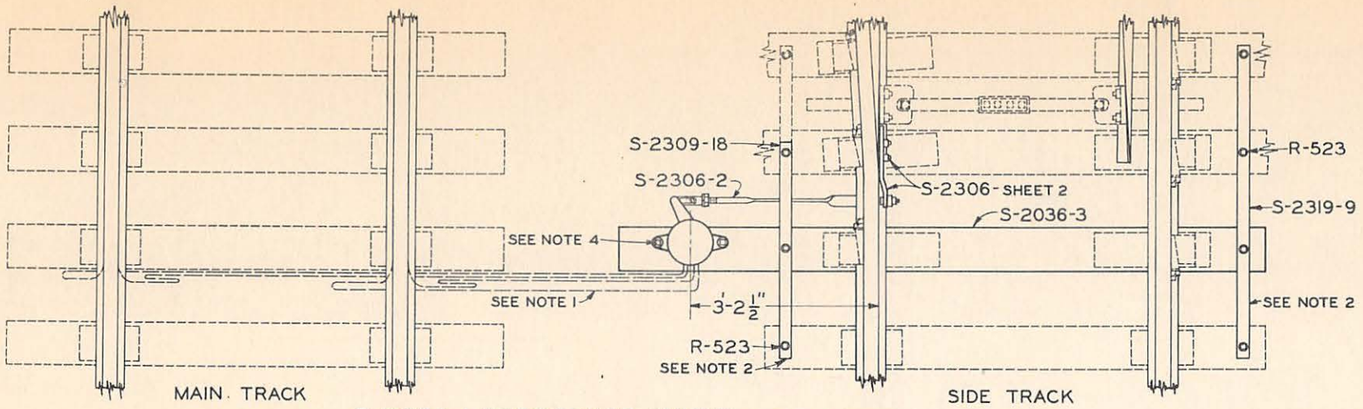
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD FOULING AND BONDING FOR SLIP SWITCHES AND MOVABLE POINT FROGS

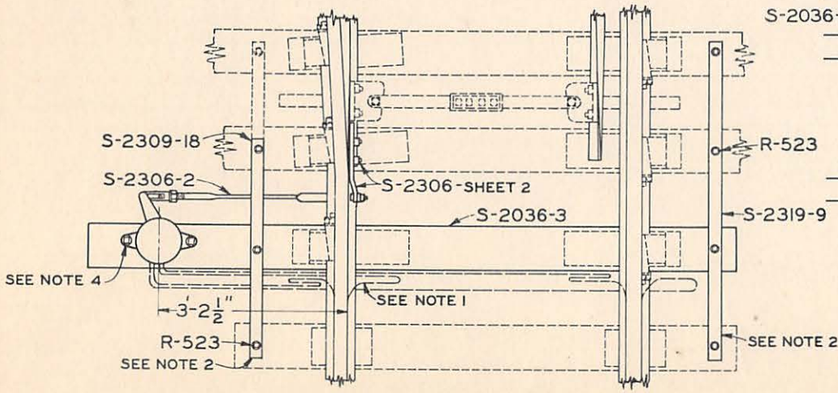
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: CHIEF ENGINEER JULY 22, 1931

S-2035



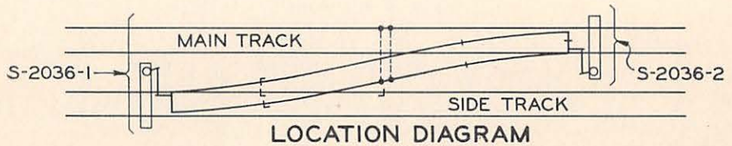
S-2036-1 CROSSOVER SHUNT MAIN TO SIDING

SCALE ②



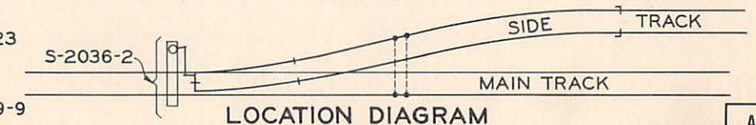
S-2036-2 SINGLE SWITCH SHUNT

SCALE ②



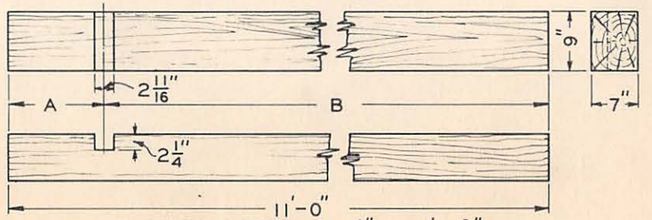
LOCATION DIAGRAM

NO SCALE



LOCATION DIAGRAM

NO SCALE



S-2036-3 TIE A=14 1/4" B=9'-9 3/4"

S-2036-4 " A=15 3/4" B=9'-8 1/4"

SCALE ①

NOTES

1. ELECTRICAL CONNECTIONS BETWEEN EACH RAIL AND SWITCH CIRCUIT CONTROLLER SHALL CONSIST OF TWO OR MORE FLEXIBLE WIRES, NO. 9 A.W.G. OR LARGER.
2. TIE STRAP S-2319-9 SHALL BE PLACED ON SIDE OF SWITCH OPPOSITE SWITCH STAND. TIE STRAP S-2309-18 SHALL BE PLACED ON SAME SIDE AS SWITCH STAND.
3. FOR FURTHER INFORMATION AS TO LOCATION OF INSULATED JOINTS SEE LATEST REVISION OF STANDARD DRAWING S-2034, STANDARD FOULING AND BONDING FOR TURNOUTS AND CROSSOVERS.
4. SWITCH CIRCUIT CONTROLLER SHALL BE SECURED TO TIE WITH TWO 3/4"X 6" HOT GALV. GIMLET POINT LAG SCREWS WITH CUT THREADS, WITH SPRING WASHER (R-523), AND FLAT WASHER.
5. TIES SHALL BE FURNISHED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-2, SWITCH TIES, AND SHALL BE TREATED, AFTER FRAMING, IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-17, PRESERVATIVE TREATMENT FOR CROSS TIES OR SWITCH TIES.
6. AFTER STARTING, LAG SCREWS SHALL BE SCREWED DOWN THEIR ENTIRE LENGTH INTO HOLES CONTAINING A SMALL AMOUNT OF CREOSOTE. HOLES SHALL BE BORED AS FOLLOWS:

DIA. OF LAG SCREW	SIZE BIT	APPROX. DEPTH
7/8"	5/8"	5 3/4"
3/4"	9/16"	3"
1/2"	3/8"	2 1/2"

7. ROD GUIDE, S-2036-8 SHALL BE SECURED TO TIE WITH TWO 1/2" X 4" HOT GALV. GIMLET POINT LAG SCREWS WITH CUT THREADS.
8. LAYOUT SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN FEET

① 0 1 2 3

② 0 1 2 3 4

APPROVED FOR USE

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ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

K.L.M.	C.D.M.	A.J.P.
C.B.P.		

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ERIE RAILROAD COMPANY
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PERE MARQUETTE RAILWAY COMPANY

STANDARD TRACK SHUNTING ARRANGEMENTS

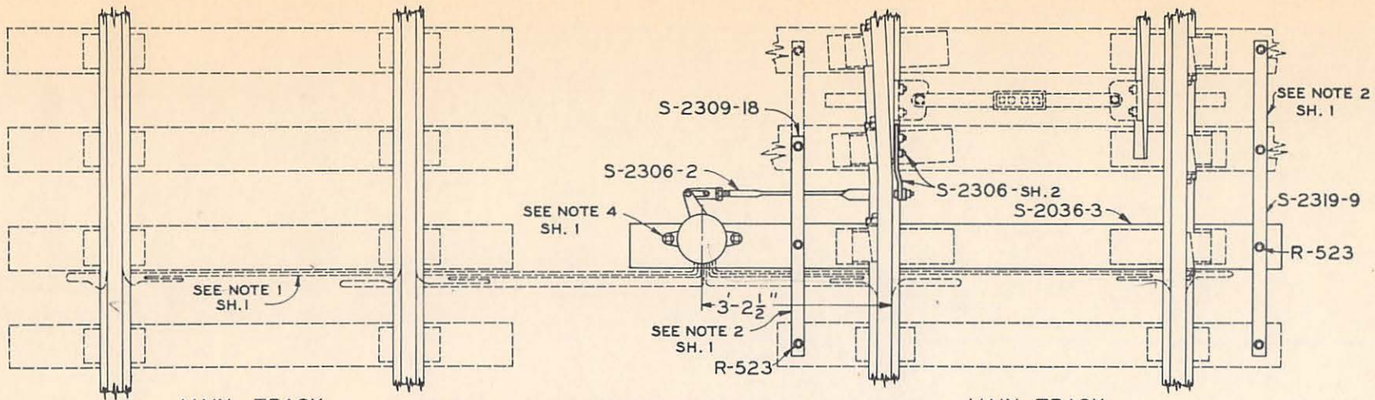
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: OCT. 16, 1934.

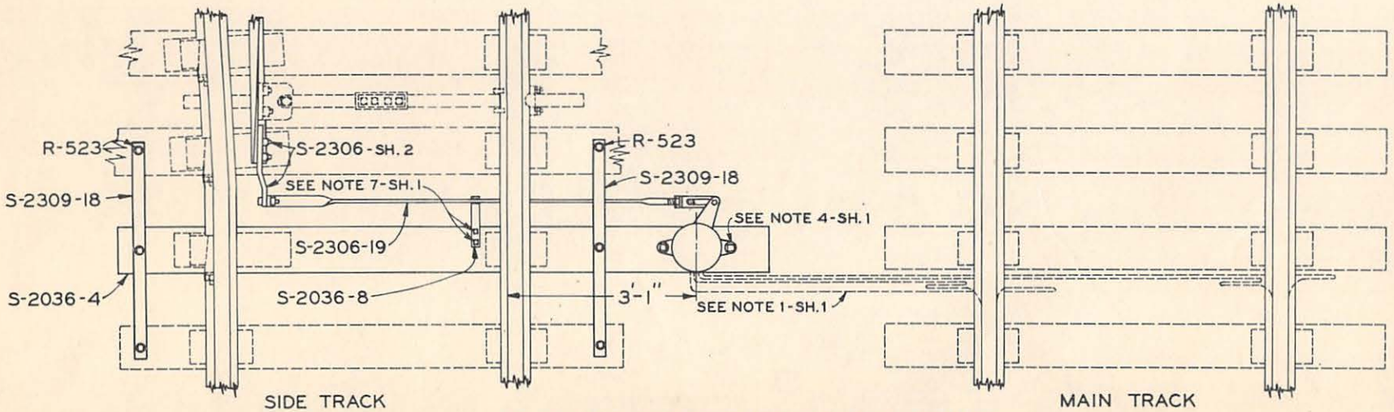
CHIEF ENGINEER

SHEET 1 OF 3

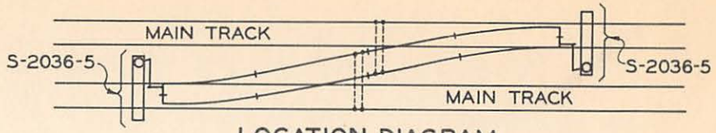
S-2036



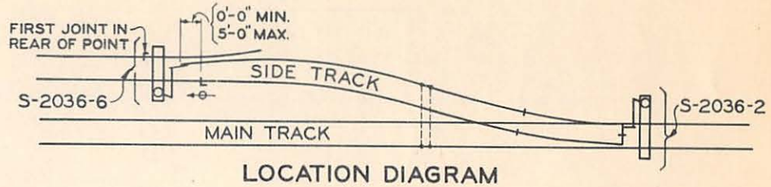
S-2036-5 CROSSOVER SHUNT MAIN TO MAIN
(FOR BOTH ENDS OF CROSSOVER)



S-2036-6 SPLIT POINT DERAIL SHUNT



LOCATION DIAGRAM
NO SCALE



LOCATION DIAGRAM
NO SCALE

-o- INSULATED JOINT SHALL BE LOCATED TO PROVIDE PROPER CLEARANCE TO TAKE CARE OF EQUIPMENT OVERHANG.

SEE NOTES ON SHEET 1

SCALE IN FEET
0 1 2 3 4

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ERIE RAILROAD COMPANY — VICE PRESIDENT	
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PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT	
K.L.M. C.B.P.	C.D.M. A.J.P.

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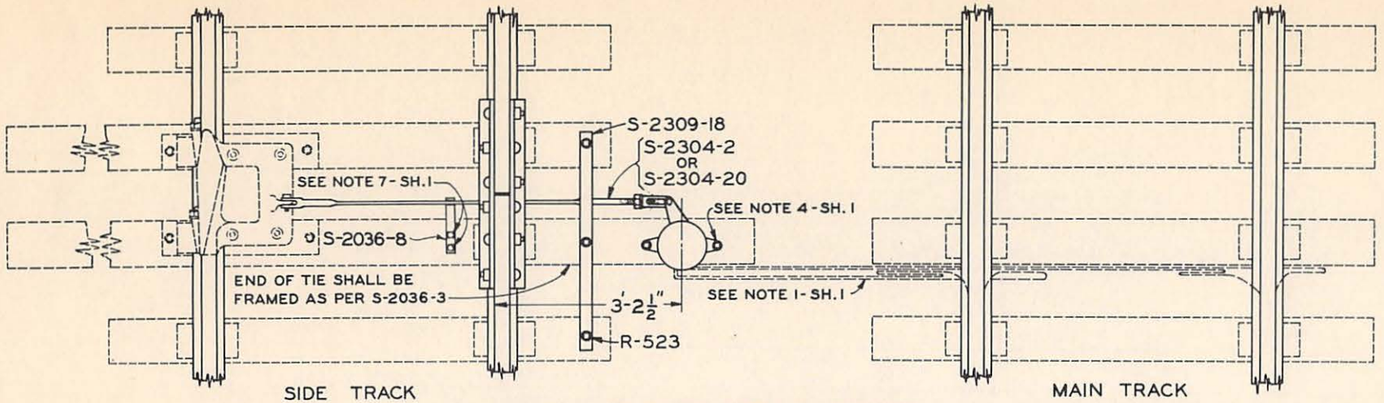
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

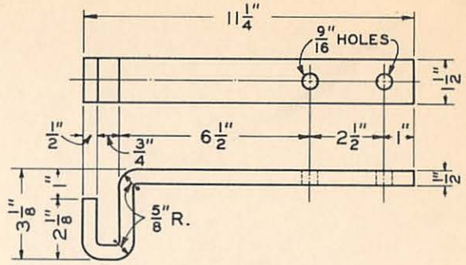
STANDARD TRACK SHUNTING ARRANGEMENTS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: OCT. 16.1934.
CHIEF ENGINEER



S-2036-7 LIFT TYPE DERAIL SHUNT

SCALE ②



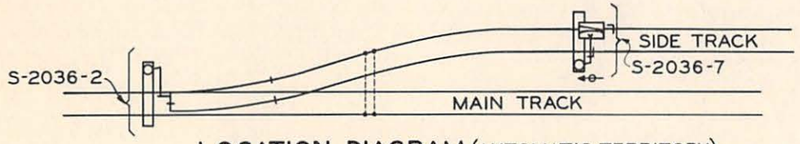
S-2036-8 ROD GUIDE

WROUGHT IRON

FASTEN TO TIE WITH ½"X 4" HOT GALV. GIMLET POINT LAG SCREWS WITH CUT THREADS

SCALE ①

SEE NOTES ON SHEET 1



LOCATION DIAGRAM (AUTOMATIC TERRITORY)

NO SCALE

⊸ INSULATED JOINT SHALL BE LOCATED TO PROVIDE PROPER CLEARANCE TO TAKE CARE OF EQUIPMENT OVERHANG.

① SCALE IN INCHES 0 1 2 3 4 5 6 7 8

② SCALE IN FEET 0 1 2 3 4

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
C. D. Boone
VICE PRESIDENT

ERIE RAILROAD COMPANY
R. E. Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
C. D. Boone
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
R. H. Bowman
VICE PRESIDENT

K. L. M.	C. D. M.	A. J. P.
C. B. P.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

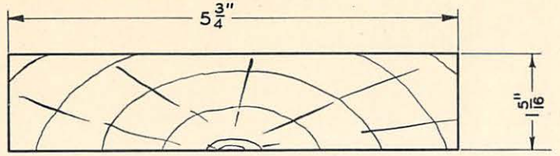
STANDARD TRACK SHUNTING ARRANGEMENTS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E. H. Hall, CHIEF ENGINEER OCT. 16, 1934.

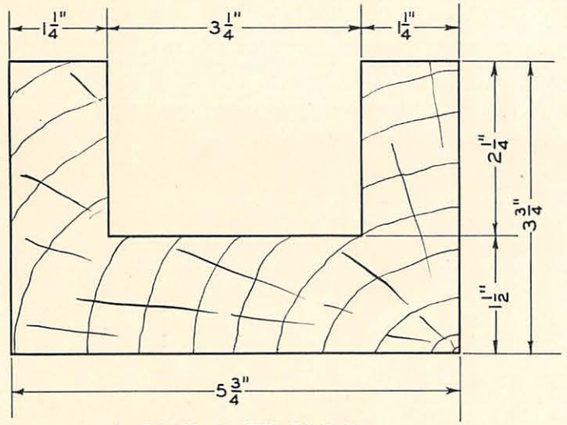
SHEET 3 OF 3

S-2036

NO. 6

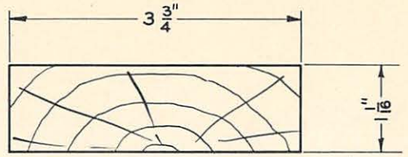


S-2037-1 CAPPING

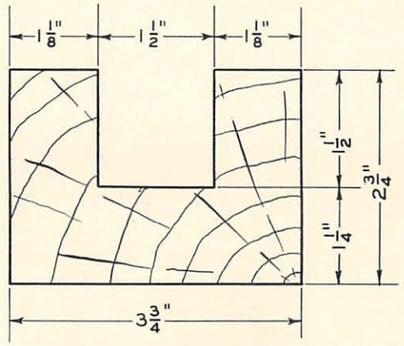


S-2037-2 TRUNKING

NO. 4



S-2037-3 CAPPING



S-2037-4 TRUNKING

NOTES

1. MATERIAL SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1539, WOOD TRUNKING AND CAPPING FOR SIGNALING PURPOSES.
2. TRUNKING AND CAPPING SHALL BE PAINTED IN THE FIELD IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES

0 1 2 3

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

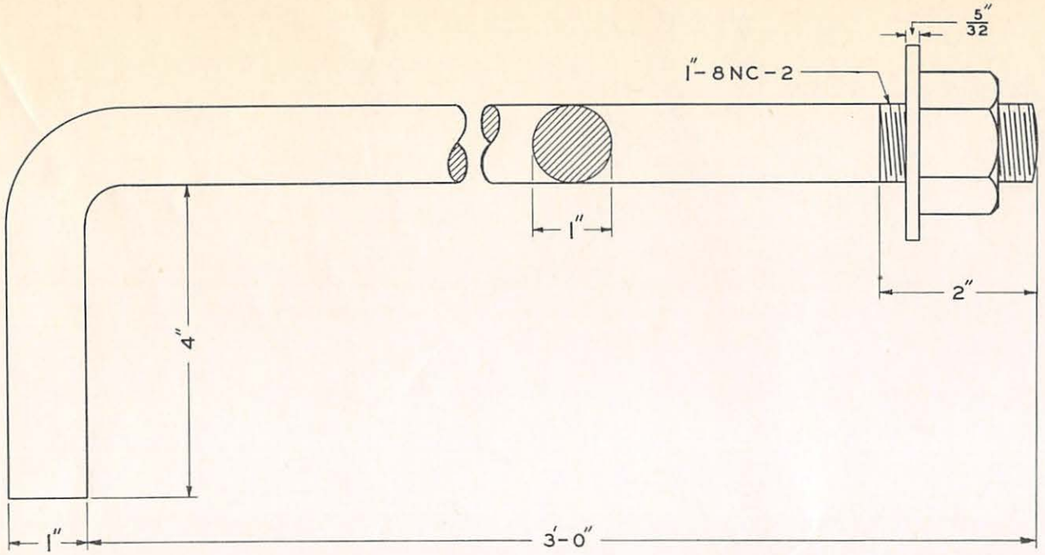
C.B.P. C.S.L. C.D.M. A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

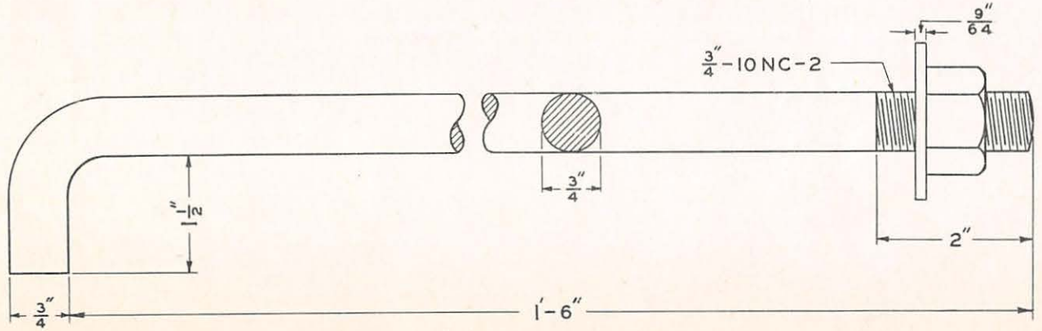
STANDARD WOOD TRUNKING AND CAPPING

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: MAY 17, 1932.
CHIEF ENGINEER

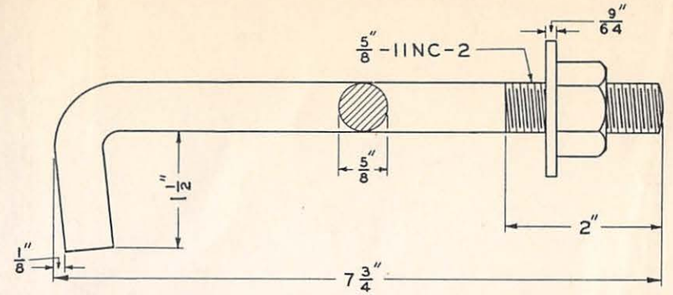
S-2037



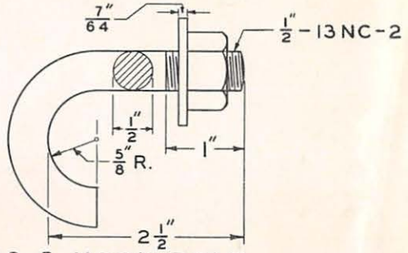
S-2038-1 BOLT O.-H. STEEL — COMPLETE WITH HEXAGON NUT AND PLAIN WASHER. FOR GROUND SIGNAL FOUNDATION.



S-2038-2 BOLT O.-H. STEEL — COMPLETE WITH HEXAGON NUT AND PLAIN WASHER. FOR FLASHER SIGNAL OR CABLE POST FOUNDATION. FOR COLOR LIGHT DWARF SIGNAL FOUNDATION.



S-2038-4 BOLT O.-H. STEEL — COMPLETE WITH HEXAGON NUT AND PLAIN WASHER. FOR PIPE CARRIER, SWITCH VALVE, OR JUNCTION BOX FOUNDATION.



S-2038-5 HOOK BOLT O.-H. STEEL
COMPLETE WITH HEXAGON NUT AND PLAIN WASHER. FOR FASTENING PIPE CARRIER SIDE TO METAL PIPE CARRIER BASE.

SCALE IN INCHES 0 1 2 3

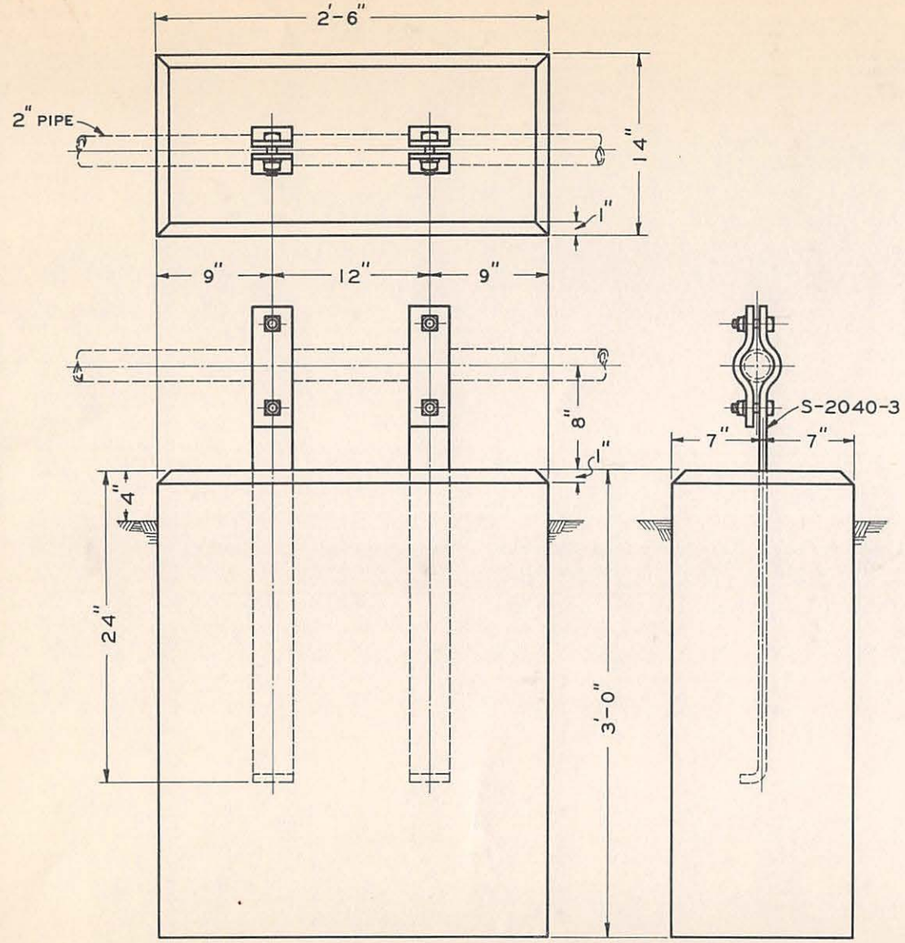
APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — Executive Vice President		
ERIE RAILROAD COMPANY — Vice President		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — President		
PERE MARQUETTE RAILWAY COMPANY — President		
W.S.E.	W.S.E.	W.N.H.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD FOUNDATION BOLTS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
Chairman
JANUARY 25, 1945

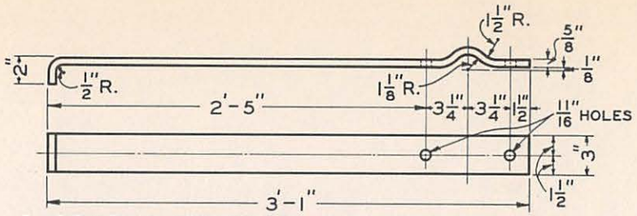
S-2038-A



S-2040-1 AIR LINE FOUNDATION

APPROXIMATE CONCRETE 8.75 CU. FT.

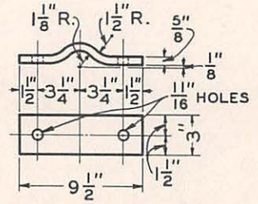
STONE IN AGGREGATE SHALL NOT EXCEED $1\frac{1}{2}$"



S-2040-2 BRACKET ONLY

S-2040-3 " COMPLETE WITH CLAMP S-2040-4, TWO ⅝" X 2¾" AMER. STD. REGULAR SQ. HD. BOLTS WITH HEAVY SQ. NUTS AND TWO 3/16" X 3/16" SPRING WASHERS.

O.-H. STEEL



S-2040-4 CLAMP

O.-H. STEEL

NOTES

1. BRACKET AND CLAMP SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. PRECAST FOUNDATION SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 2500 POUNDS PER SQUARE INCH. WHEN CAST IN THE FIELD, THE PROPORTIONS, IF BY LOOSE VOLUME MEASUREMENT OF AGGREGATES, SHALL BE AS FOLLOWS:

SIZE OF STONE	MINIMUM BAGS OF CEMENT PER CUBIC YARD OF CONCRETE	APPROXIMATE MIX PROPORTIONS
LARGER THAN 1"	6.0	1 — $2\frac{1}{2}$ — $3\frac{1}{2}$
BETWEEN $\frac{3}{4}$" AND 1"	6.5	1 — $2\frac{1}{2}$ — 3
SMALLER THAN $\frac{3}{4}$"	7.0	1 — $2\frac{1}{2}$ — $2\frac{1}{2}$

ONLY SUFFICIENT WATER SHALL BE USED TO OBTAIN A WORKABLE CONSISTENCY.

SCALE IN INCHES

0 3 6 9 12 15 18

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Moore
VICE PRESIDENT

ERIE RAILROAD COMPANY
R K Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Moore
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
J Bowman
VICE PRESIDENT

C. H. W.	C. D. M.	A. J. P.
C. B. P.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

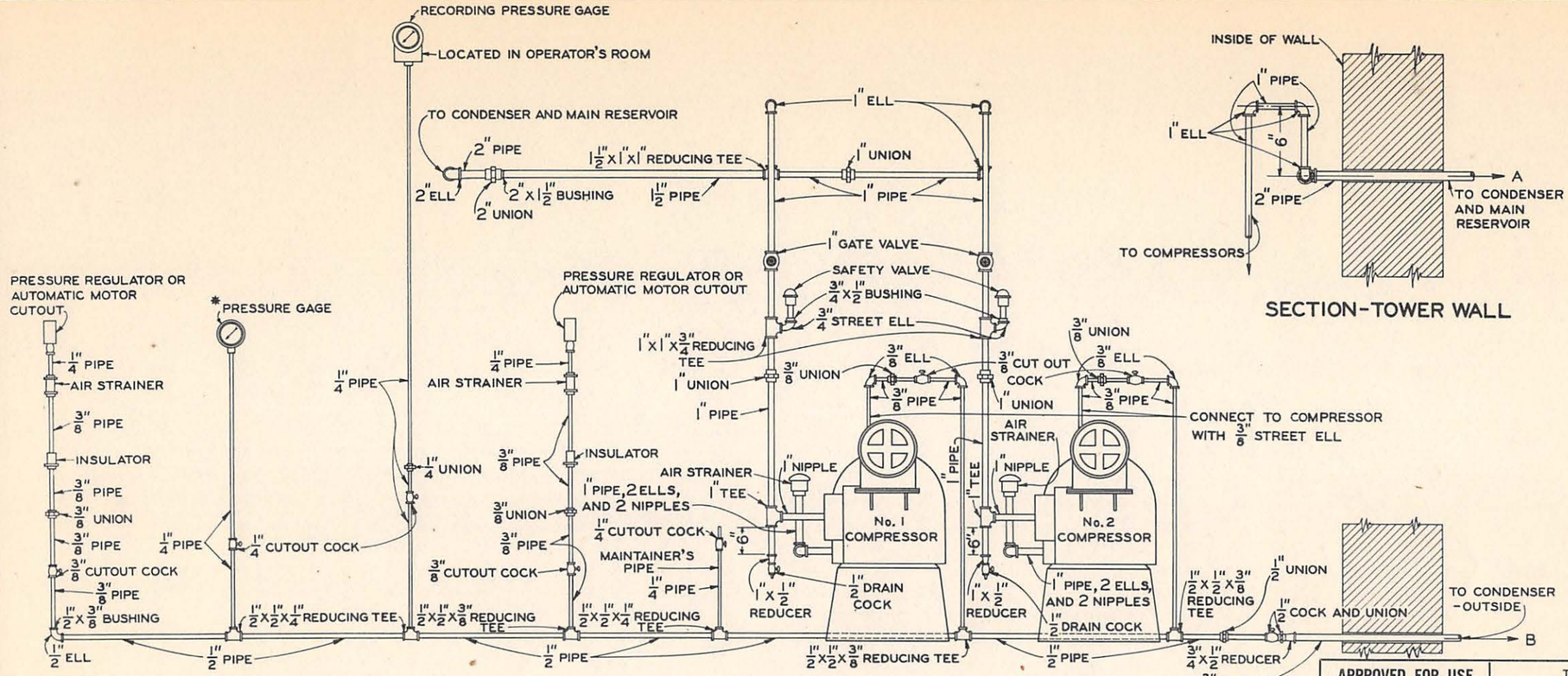
STANDARD

FOUNDATION AND BRACKET FOR ANCHORING 2" AIR LINE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: E E Winchell CHIEF ENGINEER JUNE 18, 1935

S-2040



SECTION-TOWER WALL

NOTES

1. PIPES FROM COMPRESSOR TO RESERVOIR SHALL NOT BE SMALLER THAN THE OUTLET IN THE COMPRESSOR.
2. ALL PIPE FITTINGS SHALL BE SCREW FITTINGS.

NO SCALE

* ELECTRIC ALARM GAGE MAY BE USED WHERE REQUIRED.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Booooke — VICE PRESIDENT

ERIE RAILROAD COMPANY — R E Woodruff — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D Booooke — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — J F Bowman — VICE PRESIDENT

C. B. P.	C. D. M.	A. J. P.
C. B. P.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

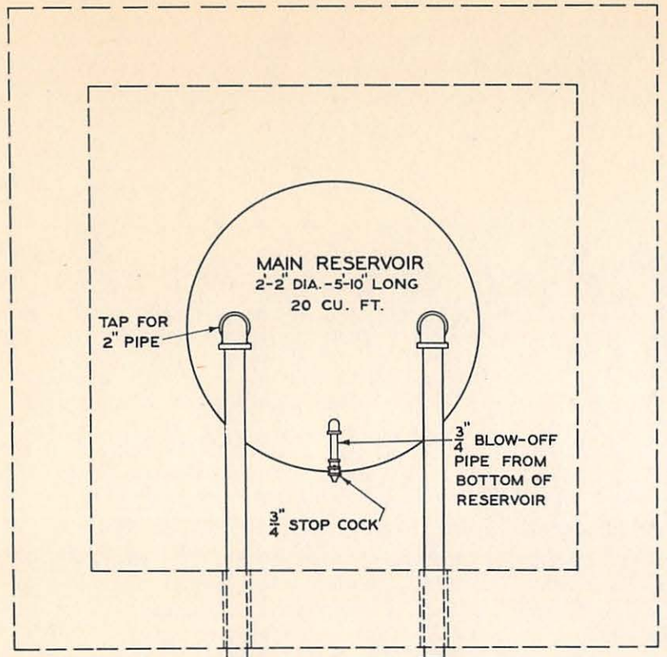
STANDARD

TYPICAL ARRANGEMENT OF AIR PIPE AT TOWERS FOR ELECTROPNEUMATIC INTERLOCKING

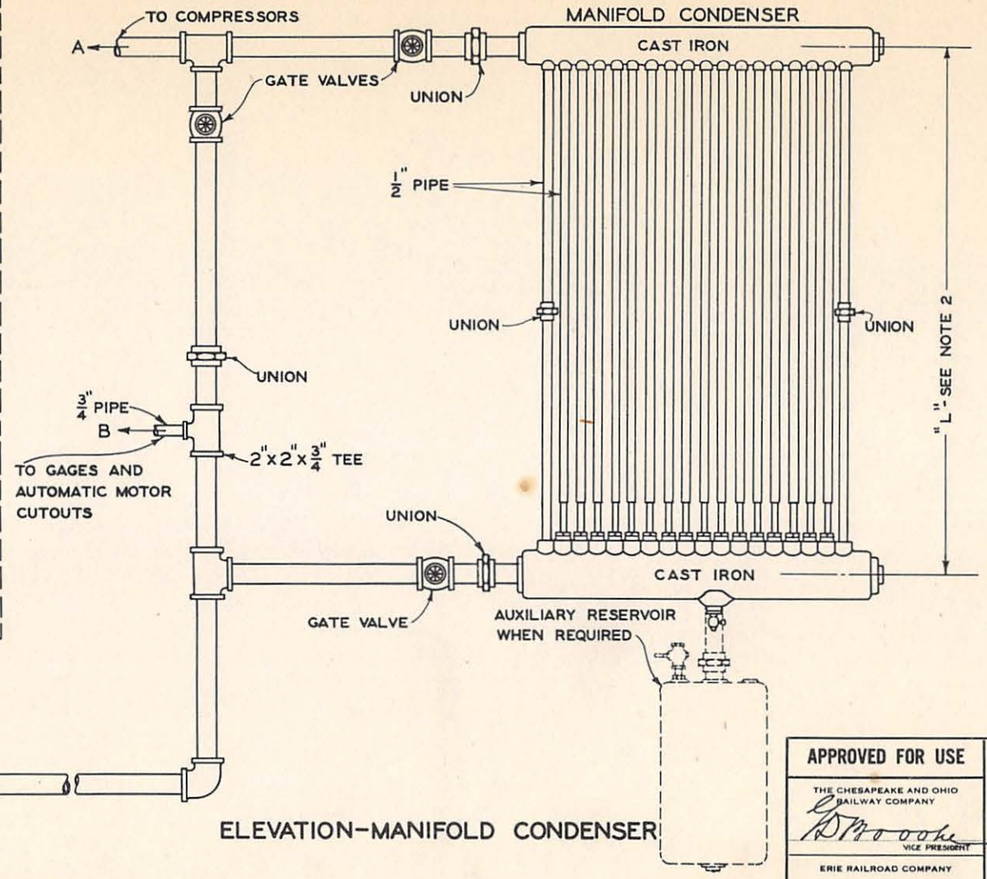
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: OCT. 7, 1935.
E W Kunkel — CHIEF ENGINEER

SHEET 1 OF 2

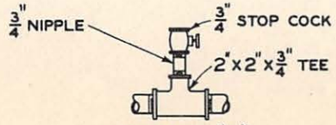
S-2041-A



PLAN – RESERVOIR



ELEVATION–MANIFOLD CONDENSER



DETAIL "A"

NOTES

1. ALL FITTINGS AND PIPE TO BE 2" UNLESS OTHERWISE SHOWN.
2. MANIFOLD CONDENSER MAY BE OBTAINED IN THREE SIZES WITH "L" DIMENSION AS FOLLOWS: 6'-3 1/2", 9'-3 1/2", 13'-6". SIZE SHALL BE AS REQUIRED.
3. THIS PIPING IS FOR LOCAL COMPRESSORS FOR AIR PRESSURES OF 75 LBS. OR UNDER.
4. MAIN RESERVOIR MAY EITHER BE SET ABOVE GROUND LINE OR IN PIT AS SHOWN.
5. EMERGENCY CONNECTION FOR LOCOMOTIVE SHALL BE PROVIDED. LOCATION WILL DEPEND UPON LOCAL CONDITIONS.
6. ALL PIPE FITTINGS SHALL BE SCREW FITTINGS.

NO SCALE

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT

ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

C.B.P. K.L.M. C.D.M. A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

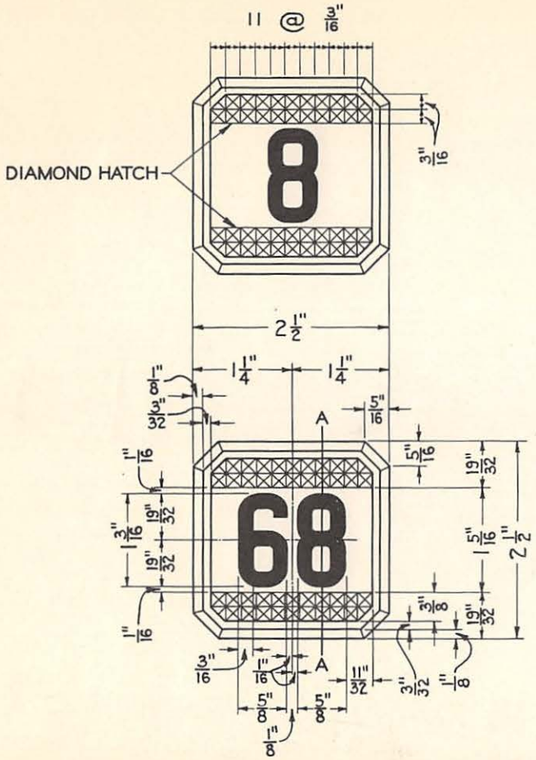
STANDARD

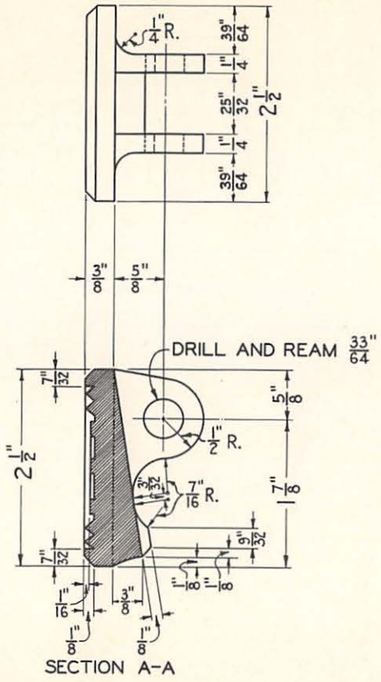
TYPICAL ARRANGEMENT OF AIR PIPE AT TOWERS FOR ELECTROPNEUMATIC INTERLOCKING

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: OCT. 7, 1935.
CHIEF ENGINEER

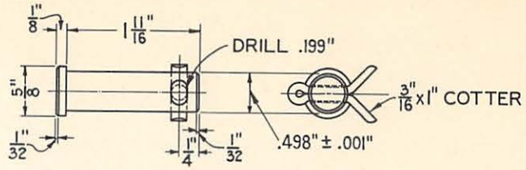
SHEET 2 OF 2

S-2041-A





SECTION A-A



S-2044-2 PIN WITH COTTER
COLD ROLLED STEEL

S-2044-1 LEVER NUMBER PLATE ONLY
CAST IRON

S-2044-3 LEVER NUMBER PLATE COMPLETE WITH PIN, S-2044-2

NOTE
WHEN ORDERING SPECIFY LEVER NUMBER.

SCALE IN INCHES
0 1 2 3

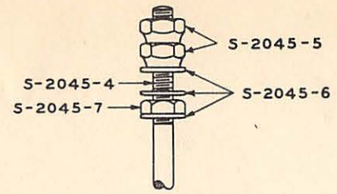
APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT	
ERIE RAILROAD COMPANY — VICE PRESIDENT	
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT	
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT	
C. B. P. / C. B. P.	C.D.M. / A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

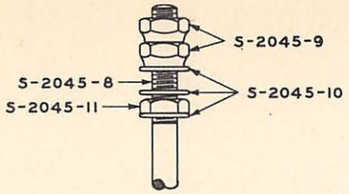
STANDARD LEVER NUMBER PLATE FOR MECHANICAL INTERLOCKING MACHINE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: APRIL 21, 1931
CHIEF ENGINEER

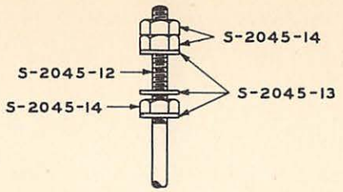
S-2044



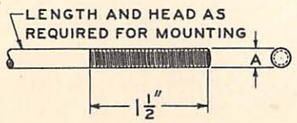
S-2045-1 BINDING POST 14-24



S-2045-2 BINDING POST $\frac{5}{16}$"-18

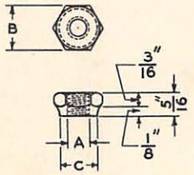


S-2045-3 BINDING POST 10-32



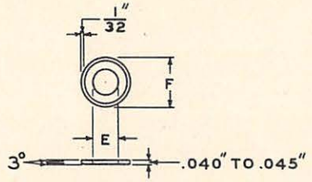
BOLT

COPPER BASE ALLOY HIGH STRENGTH



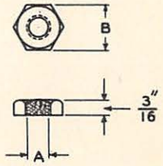
BINDING NUT

BRASS



WASHER

NO. 18 B.&S. GAGE HARD ROLLED COPPER



CLAMP NUT

BRASS

BOLT	A
S-2045-4	14-24
S-2045-8	$\frac{5}{16}$"-18
S-2045-12	10-32

BINDING NUT	A	B	C
S-2045-5	14-24	$\frac{1}{2}$"	$\frac{7}{16}$"
S-2045-9	$\frac{5}{16}$"-18	$\frac{9}{16}$"	$\frac{1}{2}$"

WASHER	E	F
S-2045-6	$\frac{17}{64}$"	$\frac{9}{16}$"
S-2045-10	$\frac{21}{64}$"	$\frac{5}{8}$"
S-2045-13	$\frac{13}{64}$"	$\frac{1}{2}$"

CLAMP NUT	A	B
S-2045-7	14-24	$\frac{1}{2}$"
S-2045-11	$\frac{5}{16}$"-18	$\frac{9}{16}$"
S-2045-14	10-32	$\frac{7}{16}$"

NOTES

1. BINDING POSTS SHALL BE COPPER BASE ALLOY HIGH STRENGTH WHICH SHALL BE IN ACCORDANCE WITH LATEST REVISION A. A. R. SIGNAL SECTION SPECIFICATION 159 AND PHYSICAL REQUIREMENTS OF A. A. R. SIGNAL SECTION BINDING POSTS DRAWING NUMBER 1070-F.
2. NUTS SHALL BE MADE OF STOCK BRASS WHICH SHALL BE IN ACCORDANCE WITH LATEST REVISION OF A. S. T. M. STANDARD SPECIFICATION FOR FREE CUTTING BRASS ROD FOR USE IN SCREW MACHINES, A. S. T. M. DESIGNATION: B16.
3. WASHERS SHALL BE MADE OF HARD ROLLED COPPER AND SHALL BE FREE OF ALL SHARP EDGES.
4. ALL PARTS SHALL BE NICKEL PLATED.

SCALE IN INCHES

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
A. A. Cournaster
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
W. D. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
C. D. Beale
VICE PRESIDENT

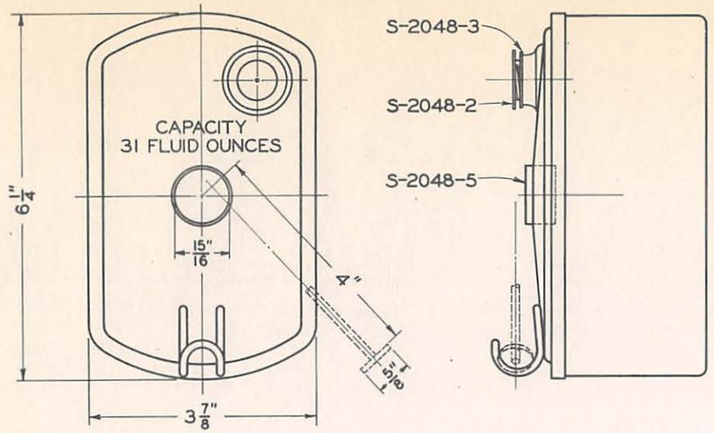
PERE MARQUETTE RAILWAY COMPANY
R. J. Bowman
PRESIDENT

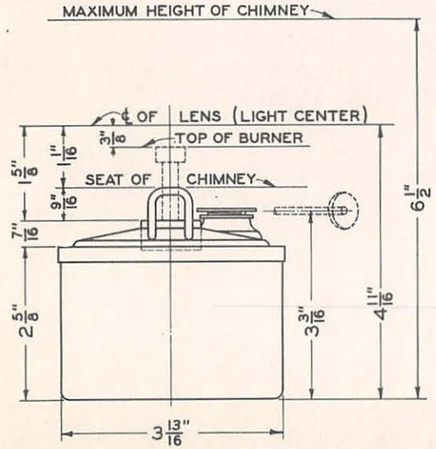
C. B. P.	W. S. E.	W. N. H.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

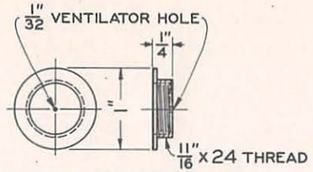
STANDARD BINDING POSTS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. E. Wallace
CHAIRMAN
OCT. 25, 1943

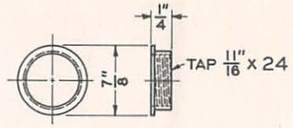




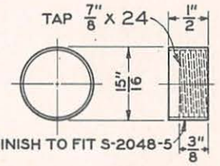
S-2048-1 FOUNT COMPLETE AS SHOWN
SCALE (1)



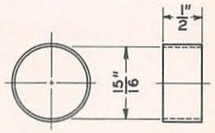
S-2048-2 FEEDER CAP
NO. 20 A.W.G. BRASS
SCALE (2)



S-2048-3 FEEDER COLLAR
NO. 20 A.W.G. BRASS
SCALE (2)

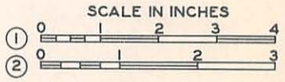


S-2048-4 BURNER COLLAR
NO. 20 A.W.G. BRASS TUBING
SCALE (2)



S-2048-5 FOUNT COLLAR
NO. 20 A.W.G. BRASS TUBING
SCALE (2)

NOTE
FOUNT SHALL BE MADE OF NO. 22 U.S. STANDARD GAGE DRAWN STEEL, TINNED.
BODY SHALL BE PRESSED OUT OF ONE PIECE, WITH TOP SOLDERED ON.



APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
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C. H. W.	C. D. M.	A. J. P.
C. B. P.		

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STANDARD OIL FOUNT FOR SEMAPHORE SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: CHIEF ENGINEER APRIL 18, 1933.

S-2048

REFERENCE NUMBER	WATTS	AMPS.	C.P.	VOLTS	BULB	BASE	FILAMENT			
							MAJOR SEC.	SHAPE	L. C. L.	TOLERANCE
S-2050-1	18		16.5	10	A-15	2-PS		C-2V	2 7/32"	± 1/64"
S-2050-3	18		14.2	10	A-15	3-PS		2C-2V	2 3/16"	± 1/64"
S-2050-6	10		9.35	8	S-11	SC		C-2V	1 1/4"	± 1/64"
S-2050-8	10		9.35	10	S-11	SC		C-2V	1 1/4"	± 1/64"
S-2050-9	10			10	CT-7	SC		C-2R	1 1/4"	± 1/64"
S-2050-10	30		31.0	10	A-15	2-PS		C-2V	2 7/32"	± 1/64"
S-2050-12	18		16.8	8	A-15	3-PS		C-2R	2 3/16"	± 1/64"
S-2050-13	9.0		7.7	12	G-16 1/2	2-PS		C-2R	1.91"	± 1/64"
S-2050-16	13		12	8	S-11	SC	MF	C-2	1 1/4"	± 1/64"
	3.5		1.6				SF	C-12		
S-2050-17	5		3.85	8	S-11	SC		C-2V	1 1/4"	± 1/64"
S-2050-18	5		3.95	10	S-11	SC		C-2V OR C-2R	1 1/4"	± 1/64"
S-2050-19		0.250	2.6	13.5	✛S-11	SC		C-2R	1 1/4"	± 2/64"
S-2050-20		0.250		13.5	✛S-11	ΘDC		C-2R	1 1/4"	± 2/64"
S-2050-21		0.170		12	T-2	SL. 1		C-21		
"		0.105-0.120		"	"	SL. 2	CARBON			
S-2050-22			3	12-16	G-6	DC		C-2R	3/4"	
S-2050-23	1.25		0.6	12	✛G-8	S.CAN		C-2V	1"	
S-2050-24		0.150		2.5	✛S-11	SC		C-2R	1 1/4"	± 2/64"
S-2050-25			3	18-24	✛G-6	S.MIN		C-2V	7/8"	
S-2050-27			3	12-16	G-6	SC		C-2R	3/4"	
S-2050-29	3		1.88	4	S-11	SC		C-2R	1 1/4"	± 1/64"
S-2050-30		0.09-0.120		18	T-2	SL. 2	CARBON			
S-2050-35	18		19.0	10	S-11	SC		C-2V	1 1/4"	± 1/64"
S-2050-36		0.25		10	✛S-11	SC		C-2R	1 1/4"	± 2/64"
S-2050-37		0.300		3.5	✛S-11	SC		C-2R	1 1/4"	± 2/64"
S-2050-39	5			10	CT-7	SC		C-2R	1 1/4"	± 1/64"
S-2050-40	18		16.5	10	A-15	2-PS	MF	C-2V	2 7/32"	± 1/64"
	3.5		1.65				SF	CC-6		
S-2050-41	30		31.0	10	A-15	2-PS	MF	C-2V	2 7/32"	± 1/64"
	6		4.0				SF	CC-6		

LEGEND

BULB:

- SHAPE — SEE CURRENT A. A. R. SIGNAL SECTION 1541
- COLOR — CLEAR UNLESS OTHERWISE NOTED
- ATMOSPHERE — GAS UNLESS OTHERWISE NOTED
- ✛ — VACUUM

BASE (SEE CURRENT A. A. R. SIG. SEC. 1542):

- B. MIN — BAYONET MINIATURE, SINGLE CONTACT
- S C — BAYONET CANDELABRA, SINGLE CONTACT
- D C — BAYONET CANDELABRA, DOUBLE CONTACT
- S. MIN — SCREW MINIATURE
- S. CAN — SCREW CANDELABRA
- S. MED — SCREW MEDIUM
- 2-PS — REBASED WITH 2 PIN SLEEVE (U. S. & S. CO.)
- 3-PS — REBASED WITH 3 PIN SLEEVE (G. R. S. CO.)
- 1825 — USED WITH 2 AND 3 PIN SLEEVE
- SL. 1 — SLIDE TELEPHONE SWITCHBOARD TYPE (902 W-G-GRS)
- SL. 2 — SLIDE TELEPHONE SWITCHBOARD TYPE (W. E. - U. S. & S.)

FILAMENT:

- M F — MAJOR FILAMENT
- S F — SECONDARY FILAMENT
- SHAPE — SEE CURRENT A. A. R. SIG. SEC. 1543
- INV. — INVERTED
- NOTE — PLANE OF BASE PINS AT RIGHT ANGLES TO PLANE OF FILAMENT UNLESS OTHERWISE NOTED
- Θ — PLANE OF BASE PINS PARALLEL TO PLANE OF FILAMENT
- L C L — LIGHT CENTER LENGTH IN INCHES
- TOLERANCE — PLUS-MINUS DIMENSIONS IN INCHES ALLOWED ON L C L AND A A (AXIAL ALIGNMENT). WHERE NO TOLERANCE IS SHOWN, MANUFACTURER'S STANDARD TO APPLY.
- MATERIAL — TUNGSTEN UNLESS OTHERWISE NOTED UNDER M F

LIFE HOURS:

MANUFACTURER'S LABORATORY RATED AVERAGE BURNING HOURS OF A GROUP OF LAMPS TESTED UNDER SPECIFIED TEST CONDITIONS.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
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H. D. Barber
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THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
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PRESIDENT

W. S. E. | W. S. E. | W. N. H.

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ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD INCANDESCENT SIGNAL LAMPS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. C. Wallace
CHAIRMAN

DEC. 8, 1942

S-2050-B

REFERENCE NUMBER	RATED VOLTAGE	RATED LIFE IN BURNING HOURS AT RATED VOLTAGE	RECOMMENDED OPERATING VOLTAGE	RECOMMENDED BURNING HOURS	PURPOSE	REFERENCE
S-2050-1	10	1500	9.0	3000	STYLE R, R-2, TR-2, N, HC-2 AND HC-32 SIGNALS	U.S.&S. CO. PC.142944 REF. AC. PL. B-2799
S-2050-3	10	1500	9.0		G. R. S. CO. COLOR LIGHT SIGNALS	G.R.S. CO. FIG. A2 PL. H-3011 DWG. 47438-6 GR. 3
S-2050-6	8	1000	7.3	930	FLASHERS, SEARCHLIGHT TYPE SIGNALS AND STORAGE BATTERY OPERATED WIGWAGS, HC-5, A.&W. CO. AND HALL FLASHERS, STOP SIGNALS	G.R.S. CO. 34866-43, U.S.&S. CO. PC.142967 DWG.B-12409,SH18
S-2050-8	10	1000	9.0	1000	POSITION LIGHT DWARF SIGNALS, CROSSING GATE LAMPS, FLASHER LIGHT SIGNALS (PRIMARY BATTERY)	U. S. & S. CO. PC. 146930 DWG. B-12409-18
S-2050-9	10	1000	9.2	930	A. & W. CO. C. L. T. O. SIGNAL	GRAYBAR, G. R. S. CO. 34866-15, G. E. CO., W. L. CO.
S-2050-10	10	1500	9.0	3000	R-2, HUMP YARD SIGNALS AND OTHERS REQUIR. HIGH C.P. LAMPS	U. S. & S. CO. PC. 144543
S-2050-12	8	1500	7.3	1395	G. R. S. CO. STYLE G COLOR LIGHT SIGNALS	G. R. S. CO. 47438-9 GR. 4
S-2050-13	12	1500	11.0	1395	HC-1 FLASHERS, POSITION LIGHT HIGH SIGNALS	U. S. & S. CO. PC. 152591 DWG. B-12409-23, G. R. S. CO. FIG. F PL. H-3011 DWG. 47438-14 GR. 1
S-2050-16	8	◉1000	7.2	4000	SEARCHLIGHT SIGNALS	U.S.&S. CO. PC. 159440 DWG. B-12409-24, G.R.S. CO. 34866-37
S-2050-17	8	1000	7.2	1000	SEARCHLIGHT SIGNALS APP. LIGHTED FROM PRIMARY BATTERY, ALL TYPES WIGWAG SIGNALS, SWITCH IND. LIGHTS	U. S. & S. CO. PC. 168741 DWG. B-12409 - SH. 18 (P23 - U5037)
S-2050-18	10	1000	9.0	1000	ILLUMINATED STOP SIGNS, PRIMARY BATTERY OPERATED FLASHER SIGNALS, D W FLAGMAN, A. & W. CO. SIGNALS, SEMAPHORE, SWITCH, AND PIER LAMPS	U. S. & S. CO. PC. 148970, G. R. S. CO. 34866-38
S-2050-19	13.5	1000	11.0	4000	SEMAPHORE SIGNALS, AUTOMATIC FLAGMAN BANNERS, APPROACH LIGHTING, INTERLOCKING SIGNALS, CHART LIGHTS, CONTINUOUS LIGHTING SEMAPHORE SIGNALS (A. C. POWER), SWITCH IND. LIGHTS	U. S. & S. CO. P C. 120803, THOS. A. EDISON CO., G. E. CO., W. L. CO., G. R. S. CO. 34866-6
S-2050-20	13.5	1000	12.0	2000	SEMAPHORE SIGNALS, EDISON ADAPTERS, AND A. & W. CO. LAMP CASES	G. E. CO., W. L. CO., GRAYBAR, U. S. & S. CO. PC. 124019
S-2050-21	12			INDEFINITE	B-20 TABLE LEVERS, ANNUNCIATOR AND TRACK MODELS, CAR RETARDER MACHINES AND U. S. & S. CO. B-10 TABLE LEVERS	TYPE 2F SWITCHBOARD LAMP (W. E. CO. TEL. CAT.), G. R. S. CO. 52879-6, U. S. & S. CO. C. N. 71615, G. E. CO., W. L. CO.
S-2050-22	12-16	1000	9.0	1320 INDEFINITE	U. S. & S. CO. MODEL BOARD, NEW E. P. MACHINE LEVER LIGHTS, U. S. & S. CO. TABLE UNIT INDICATION LIGHTS AND SWITCH INDICATORS	MAZDA 68, G. R. S. CO. 48088-6, GRAYBAR, G. E. CO., W. L. CO., U. S. & S. CO. PC. 116342 DWG. B-12409-11
S-2050-23	12	1250	10.0	INDEFINITE	INDICATOR CABINETS, OLD E. P. MACHINE LEVER LIGHTS	U. S. & S. CO. PC. 75679 DWG. B-12409-11, G. E. CO., W. L. CO.
S-2050-24	2.5	1000			CONTINUOUS LIGHTING SEMAPHORE SIGNALS, PRIMARY BATTERY CROSSING GATE LAMPS, SWITCH INDICATORS, CONTINUOUS LIGHTING FROM 4 CELLS OF PRIMARY BATTERY FOR EACH LAMP USED	G. R. S. CO. 34866-65, G. E. CO., W. L. CO., U. S. & S. CO. PC. 188498 DWG. B-12409 SH. 12
S-2050-25	18-24	200	18.0	INDEFINITE	OLD E. P. MACHINE LEVER LIGHTS	GRAYBAR, U.S. &S.CO.PC.120226 DWG.B-12409-11, G. E. CO., W. L. CO.
S-2050-27	12-16	1000	10.0	1320	G.R.S. CO. AND R.A. CO. TRACK MODELS, INDICATOR LIGHTS ON G.R.S. CO. AND SOME U.S.&S. CO. TABLE UNITS, G.R.S. CO. MACHINE AND T.O. CONTROL TABLE UNIT	MAZDA 67, GRAYBAR, G. E. CO., W. L. CO., G. R. S. CO. FIG. 61-A DWG. 48088-5 PL. G-2015, U. S. & S. CO. PC. 120270 DWG. B-12409-11
S-2050-29	4	1000	4.0	1000	G. R. S. CO. SEARCHLIGHT SIGNAL	G. R. S. CO. FIG. 34 DWG. 34866-35 PL. H-2619, U. S. & S. CO. PC. 176043 DWG. B-12409 SH. 18
S-2050-30	18				C. T. C. MACHINE	SWITCHBOARD LAMP, W.E.CO. 2-R, U.S. & S.CO. C.N. 71638
S-2050-35	10	1000	9.0	1000	WIGWAG AND HIGHWAY FLASHER LIGHT SIGNALS, SEMAPHORE AND COLOR-POSITION LIGHT SIGNALS, POSITION LIGHT DWARF SIGNALS	U. S. & S. CO. PC. 151138
S-2050-36	10	1000	9.2	930	SEMAPHORE, SWITCH AND PIER LAMPS	G. E. CO., W. L. CO., U. S. & S. CO. P C. 120801, G. R. S. CO. 34866-4
S-2050-37	3.5	1000	3.2	1000	APPROACH LIGHTED SEMAPHORE SIGNALS, SWITCH INDICATOR LIGHTS	U. S. & S. CO. P C. 120799 DWG. B-12409-12, G. E. CO., W. L. CO., G. R. S. CO. 34866-2
S-2050-39	10	1000	9.2	1000	A.&W. COLOR LIGHT SIGNALS PRIMARY BATTERY	W. L. CO., G. E. CO., G. R. S. CO. 34866-14
S-2050-40	10	◉1500	9.0	6600	STYLE R, R-2, TR-2, HC-2, AND HC-32 SIGNALS	U. S. & S. CO. P C. 214227
S-2050-41	10	◉1500	9.0	6600	R-2, HUMP YARD SIGNALS, & OTHERS REQUIR. HIGH C. P. LAMPS	U. S. & S. CO. P C. 189825

◉ MAJOR FILAMENT

NOTE

DESIGN VOLTAGE FOR LAMPS SHOWN ON THIS DRAWING IS THE SAME AS THE RATED VOLTAGE EXCEPT AS FOLLOWS:

REF. NO.	RATED VOLTAGE	DESIGN VOLTAGE
S-2050-22	12-16	13
S-2050-25	18-24	22
S-2050-27	12-16	13

ABBREVIATIONS

A. & W. CO. ..... ADAMS & WESTLAKE CO.
G. E. CO. ..... GENERAL ELECTRIC CO.
G. R. S. CO. ..... GENERAL RAILWAY SIGNAL CO.
R. A. CO. ..... RAILROAD ACCESSORIES CORP.
U. S. & S. CO. ..... UNION SWITCH & SIGNAL CO.
W. E. CO. ..... WESTERN ELECTRIC CO.
W. L. CO. ..... WESTINGHOUSE LAMP CO.
DWG. ..... DRAWING NUMBER
PC. ..... PIECE NUMBER

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H.A. Commaster
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
H.W. Barber
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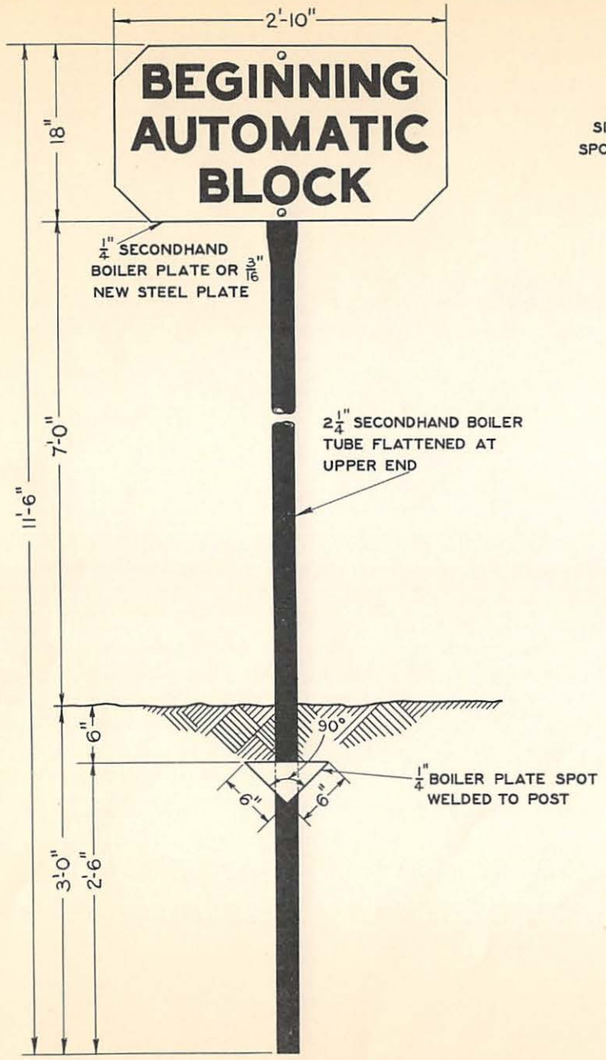
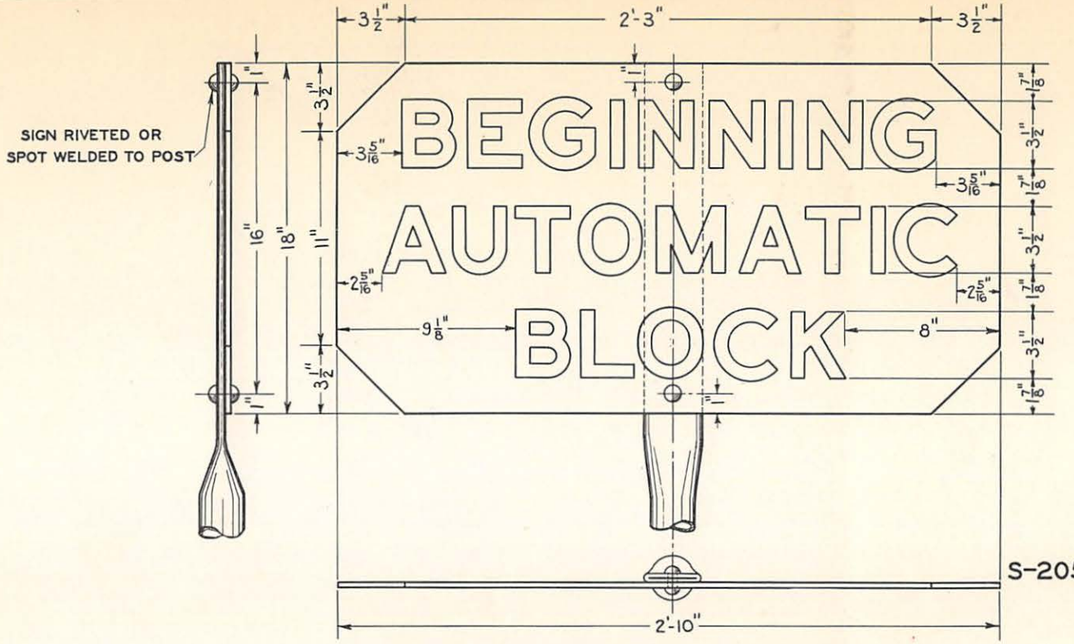
PERE MARQUETTE RAILWAY COMPANY

STANDARD FIELD AND OFFICE DATA CONCERNING INCANDESCENT SIGNAL LAMPS

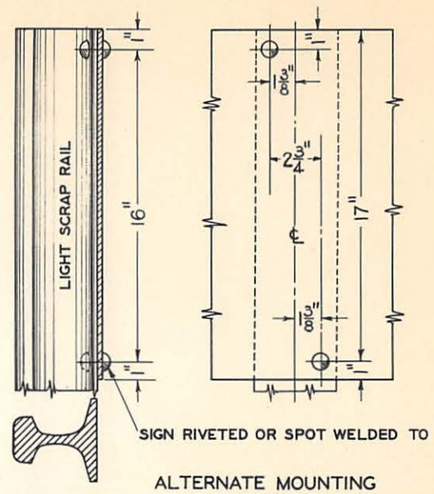
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. E. Wallace
CHAIRMAN
DEC. 8, 1942



S-2055-1 BEGINNING AUTOMATIC BLOCK SIGN COMPLETE
SCALE ②



S-2055-2 BEGINNING AUTOMATIC BLOCK SIGN ONLY
DRILLED FOR PIPE MOUNTING
SCALE ①



ALTERNATE MOUNTING

S-2055-3 BEGINNING AUTOMATIC BLOCK SIGN ONLY
DRILLED FOR RAIL MOUNTING
SCALE ①

SCALE IN INCHES.
① 0 1 2 3 6 9 12
② 0 3 6 9 12 15 18 21 24

NOTES

1. LETTERS SHALL BE PAINTED BLACK ON WHITE BACKGROUND. BACK OF SIGN SHALL BE PAINTED BLACK. WHEN BOILER TUBE IS USED, TOP SHALL BE FLATTENED AND ENTIRE TUBE DIPPED IN ASPHALT PREPARATION.
2. SIGN SHALL BE LOCATED ON RIGHT HAND SIDE OF TRACK, WITH DIRECTION OF TRAFFIC, NOT CLOSER THAN 8'-0" FROM THE NEAR EDGE OF SIGN TO THE GAGE SIDE OF THE NEAREST RAIL, EXCEPT IN NO INSTANCE SHALL THE POST BE SET IN A DITCH.
3. FOR DETAIL OF LETTERS, SEE LATEST REVISION OF STANDARD DRAWING R-549, STANDARD LETTERS AND FIGURES FOR SIGNS.
4. S-2055-1, BEGINNING AUTOMATIC BLOCK SIGN COMPLETE, MAY BE FURNISHED WITH SIGN MOUNTED ON EITHER PIPE OR SCRAP RAIL.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

C.S.L.	C.D.M.	A.J.P.
K.L.M.		

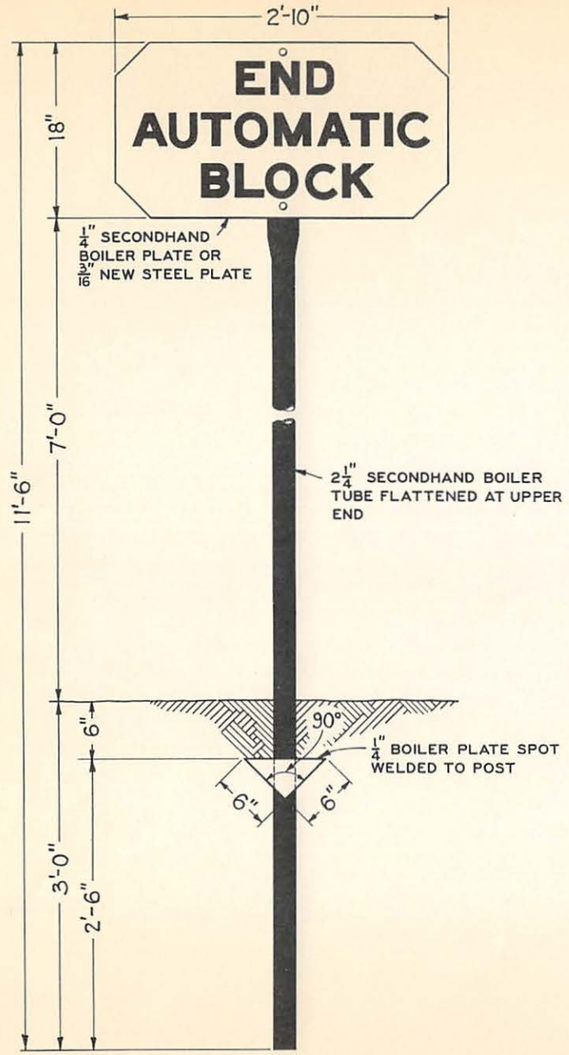
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

BEGINNING AUTOMATIC BLOCK SIGN

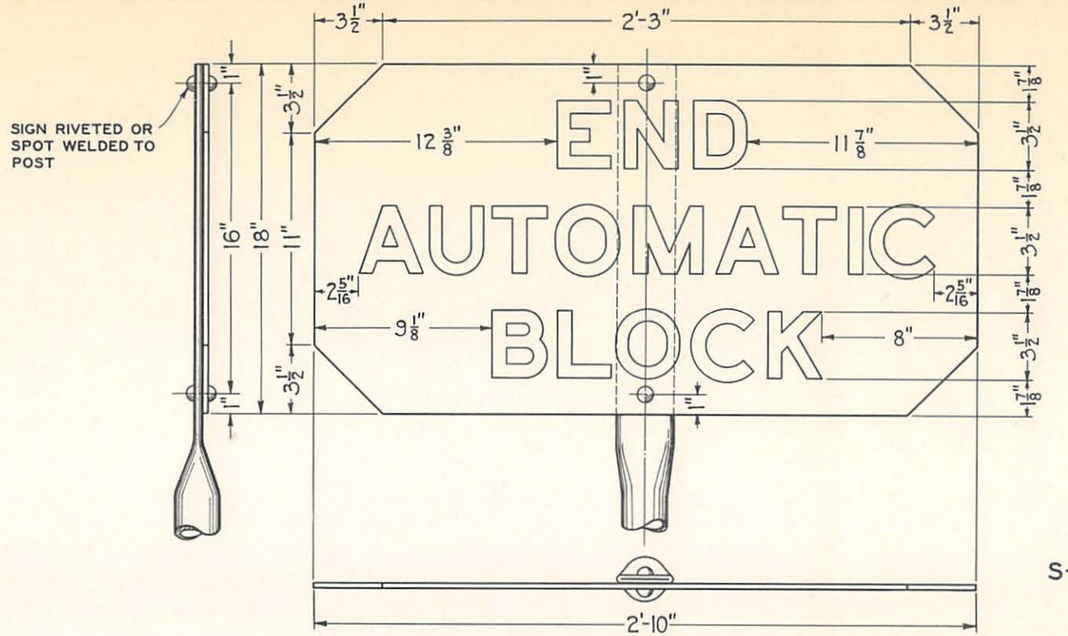
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: MAY 17, 1932.
CHIEF ENGINEER

S-2055



S-2056-1 END AUTOMATIC BLOCK SIGN COMPLETE

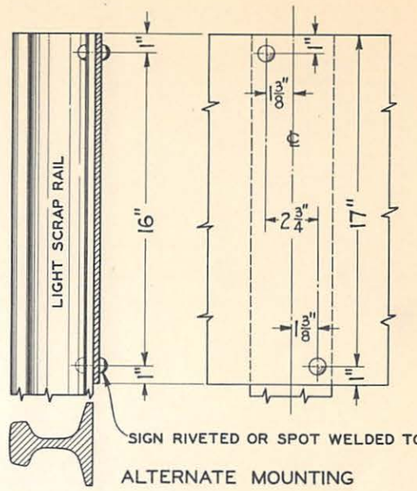
SCALE ②



S-2056-2 END AUTOMATIC BLOCK SIGN ONLY

DRILLED FOR PIPE MOUNTING

SCALE ①



ALTERNATE MOUNTING

S-2056-3 END AUTOMATIC BLOCK SIGN ONLY

DRILLED FOR RAIL MOUNTING

SCALE ①

SCALE IN INCHES

① 0 1 2 3 6 9 12

② 0 3 6 9 12 15 18 21 24

NOTES

1. LETTERS SHALL BE PAINTED BLACK ON WHITE BACKGROUND. BACK OF SIGN SHALL BE PAINTED BLACK. WHEN BOILER TUBE IS USED, TOP SHALL BE FLATTENED AND ENTIRE TUBE DIPPED IN ASPHALT PREPARATION.
2. SIGN SHALL BE LOCATED ON RIGHT HAND SIDE OF TRACK, WITH DIRECTION OF TRAFFIC, NOT CLOSER THAN 8'-0" FROM THE NEAR EDGE OF SIGN TO THE GAGE SIDE OF THE NEAREST RAIL, EXCEPT IN NO INSTANCE SHALL THE POST BE SET IN A DITCH.
3. FOR DETAIL OF LETTERS, SEE LATEST REVISION OF STANDARD DRAWING R-549, STANDARD LETTERS AND FIGURES FOR SIGNS.
4. S-2056-1, END AUTOMATIC BLOCK SIGN COMPLETE, MAY BE FURNISHED WITH SIGN MOUNTED ON EITHER PIPE OR SCRAP RAIL.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D. B. Brooks
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
E. E. Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

C.S.L. C.B.P. | C.D.M. | A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

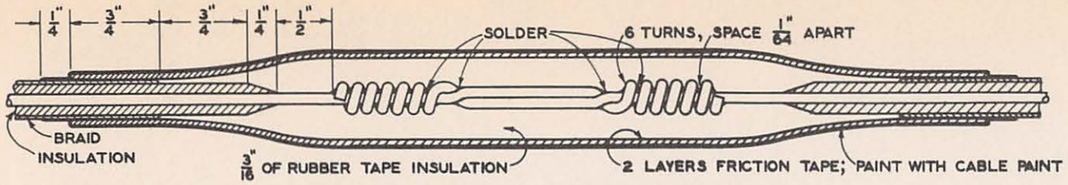
STANDARD

END AUTOMATIC BLOCK SIGN

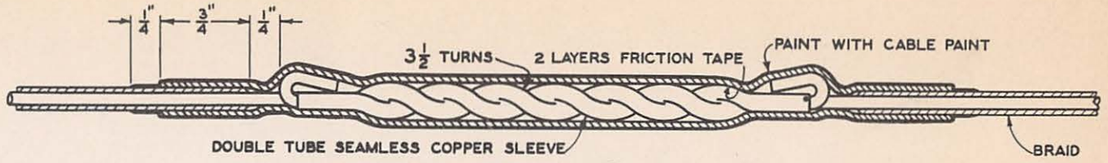
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: MAY 17, 1932.
CHIEF ENGINEER

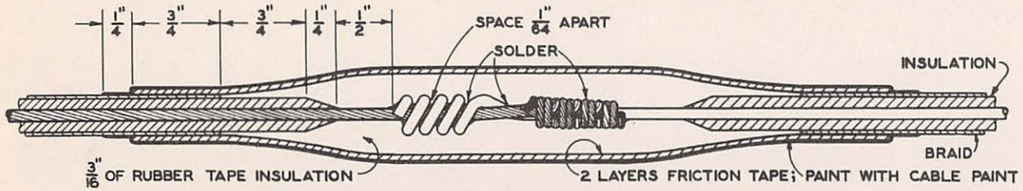
S-2056



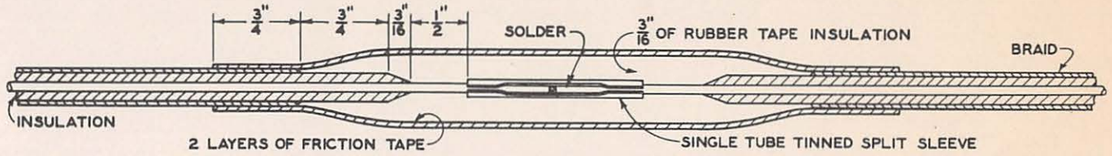
S-2057-1 SOLID COPPER WIRE JOINT



S-2057-4 SOLID LINE WIRE JOINT



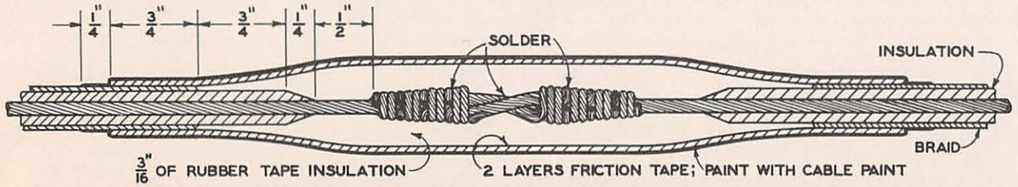
S-2057-2 STRANDED AND SOLID COPPER WIRE JOINT



S-2057-5 SOLID COPPER WIRE CABLE JOINT

NOTE

JOINTS IN INSULATED WIRES AND CABLE SHALL BE MADE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1546, INSTRUCTIONS FOR MAKING JOINTS IN INSULATED WIRES AND CABLES.



S-2057-3 STRANDED COPPER WIRE JOINT

NO SCALE

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY D Brooke VICE PRESIDENT		
ERIE RAILROAD COMPANY R E Woodruff VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY D Brooke VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY A F Bowman VICE PRESIDENT		
C.B.P. K.L.M.	C.D.M.	A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD WIRE JOINTS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E W Michel CHIEF ENGINEER APRIL 17, 1934.

S-2057-A

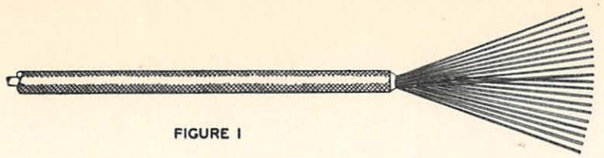


FIGURE 1

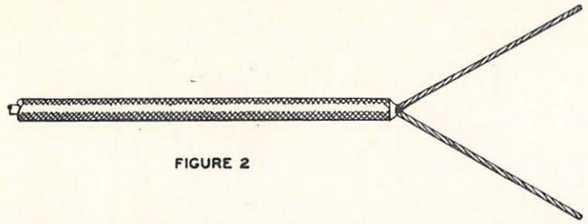


FIGURE 2

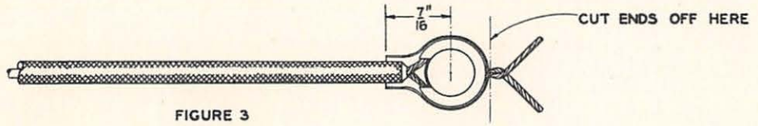


FIGURE 3

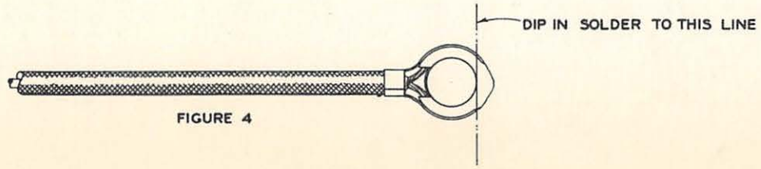


FIGURE 4

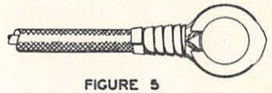


FIGURE 5

DIRECTIONS

1. Peel insulation from wire, separate strands, and clean each one thoroughly. See Figure 1.
2. Divide strands into two groups as nearly equal as possible and twist together as shown in Figure 2.
3. Place eyelet between the two twisted strands and twist projecting ends tightly together being careful to have the insulation extend into the shoulder of the eyelet as shown in Figure 3.
4. Form eyelet with parallel jaw pliers and cut off ends, (Figure 3), then solder as indicated in Figure 4.
5. Caution: Never solder the entire eyelet.
6. Shoulder may be taped with one (1) layer of friction tape, (Figure 5), and painted with one (1) coat of insulating paint.
7. Method of making eyelet connection applies to wire size Nº 16 A.W.G., 19 strands, or larger.

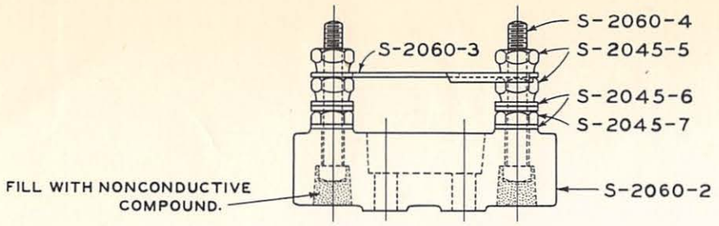
APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY VICE PRESIDENT AND GENERAL MANAGER	
ERIE RAILROAD COMPANY VICE PRESIDENT	
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY VICE PRESIDENT	
PERE MARQUETTE RAILWAY COMPANY VICE PRESIDENT	
C.S.L.	C.D.M. A.J.P.
C.S.L.	

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

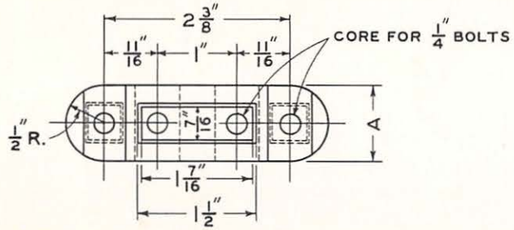
STANDARD WIRE EYELET CONNECTION

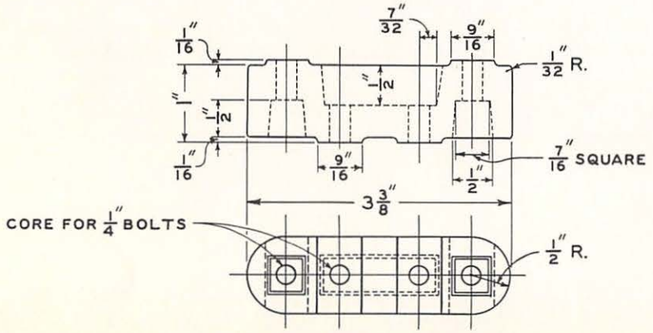
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: NOV. 17, 1931.
CHIEF ENGINEER

S-2058



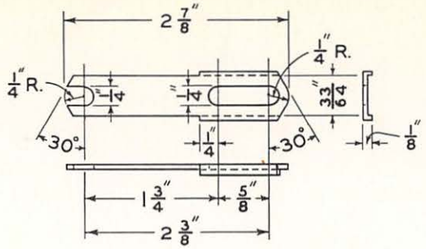
S-2060-1 TERMINAL COMPLETE





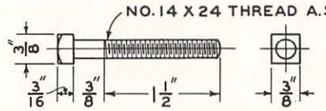
S-2060-2 PORCELAIN BASE

REVERSIBLE



S-2060-3 CONNECTOR

COPPER NO. 18 B&S GAGE



S-2060-4 BINDING POST

EVERDUR BRONZE

NOTES

1. ALL METAL PARTS SHALL BE NICKEL PLATED.
2. DIMENSION "A" SHALL BE MAXIMUM ONE (1) INCH, MINIMUM SEVEN EIGHTHS (7/8) INCH.
3. ALL SURFACES EXCEPT TOP, BOTTOM, HOLES, AND RECESSES, SHALL BE GLAZED.
4. MATERIAL SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1521, PORCELAIN TERMINAL BLOCK.

SCALE IN INCHES

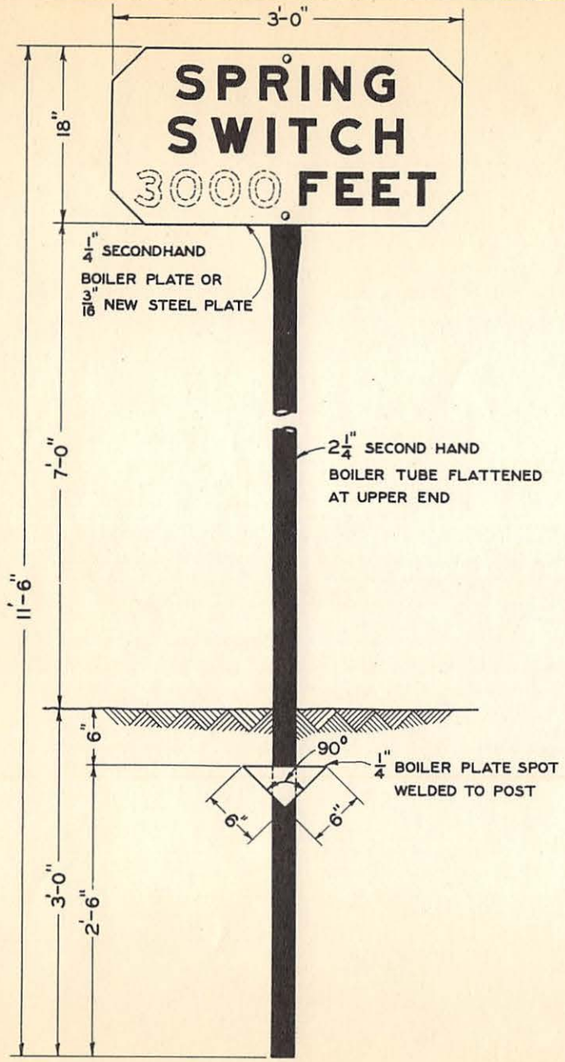
APPROVED FOR USE			
THE CHESAPEAKE AND OHIO RAILWAY COMPANY VICE PRESIDENT AND GENERAL MANAGER			
ERIE RAILROAD COMPANY VICE PRESIDENT			
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY PRESIDENT			
PERE MARQUETTE RAILWAY COMPANY VICE PRESIDENT			
C. H. W.	W. S. E.	C. A. T.	
K. L. M.			

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

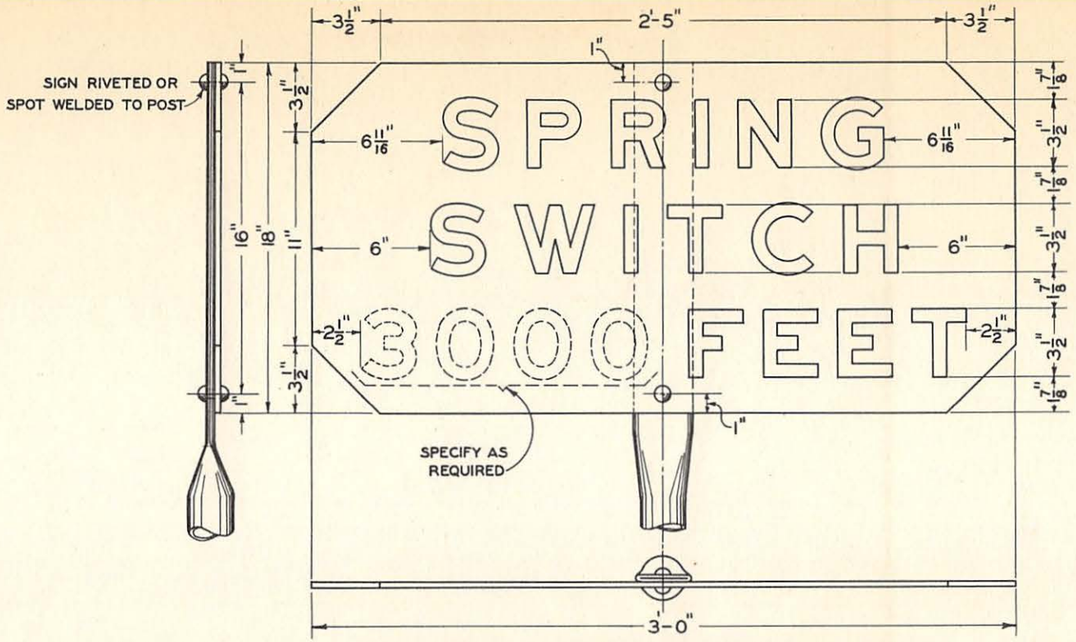
STANDARD PORCELAIN TERMINAL BLOCK

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
CHAIRMAN

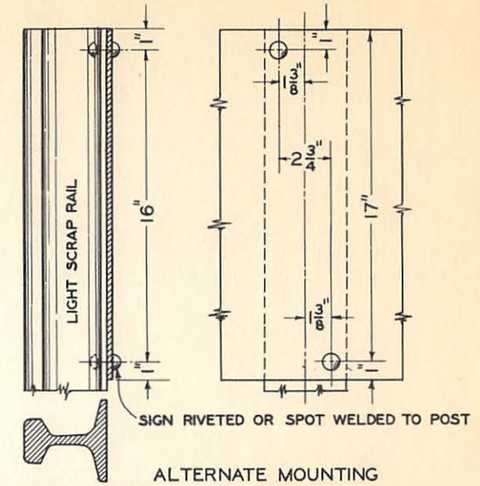
JUNE 13, 1939



S-2062-1 SPRING SWITCH SIGN COMPLETE
SCALE (2)



S-2062-2 SPRING SWITCH SIGN ONLY,
DRILLED FOR PIPE MOUNTING
SCALE (1)



ALTERNATE MOUNTING
S-2062-3 SPRING SWITCH SIGN ONLY
DRILLED FOR RAIL MOUNTING
SCALE (1)

SCALE IN INCHES
(1) 0 2 4 6 8 10 12
(2) 0 3 6 9 12 15 18 21 24

NOTES

1. LETTERS SHALL BE PAINTED BLACK ON WHITE BACKGROUND. BACK OF SIGN SHALL BE PAINTED BLACK. WHEN BOILER TUBE IS USED, TOP SHALL BE FLATTENED AND ENTIRE TUBE DIPPED IN ASPHALT PREPARATION.
2. SIGN SHALL BE LOCATED ON RIGHT HAND SIDE OF TRACK, WITH DIRECTION OF TRAFFIC, NOT CLOSER THAN 8'-0" FROM THE NEAR EDGE OF SIGN TO THE GAGE SIDE OF NEAREST RAIL, EXCEPT IN NO INSTANCE SHALL THE POST BE SET IN A DITCH.
3. FOR DETAIL OF LETTERS, SEE LATEST REVISION OF STANDARD DRAWING R-549, STANDARD LETTERS AND FIGURES FOR SIGNS.
4. S-2062-1 SPRING SWITCH SIGN COMPLETE, MAY BE FURNISHED WITH SIGN MOUNTED ON EITHER PIPE OR SCRAP RAIL.
5. WHEN CONDITIONS REQUIRE USE OF S-2062-1 SPRING SWITCH SIGN, IT SHALL BE LOCATED SO AS TO GIVE AMPLE WARNING AND THE DISTANCE TO THE SWITCH SHALL BE INDICATED ON THE SIGN.
6. S-2062-1, SPRING SWITCH SIGN, SHALL BE INSTALLED IN ACCORDANCE WITH LATEST REVISION OF STANDARD REQUISITES S-1556, SPRING SWITCHES AND THEIR SIGNAL PROTECTION.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Brooke
VICE PRESIDENT

ERIE RAILROAD COMPANY
R E Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Brooke
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A H Bowman
VICE PRESIDENT

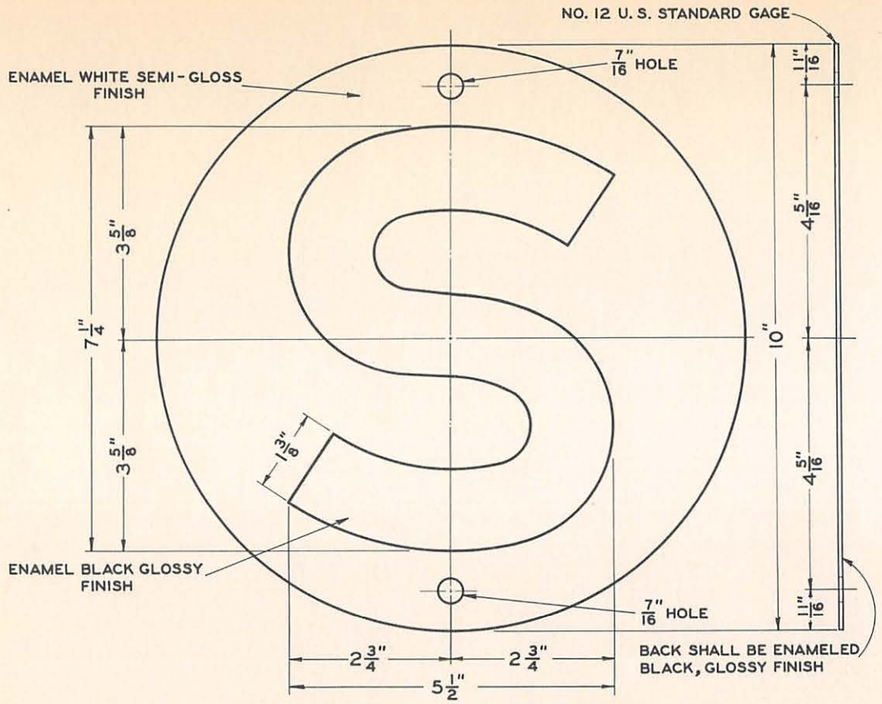
C. B. P. | K. L. M. | C. D. M. | A. J. P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD
SPRING SWITCH SIGN

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: W Wisebel FEB. 20, 1934.
CHIEF ENGINEER

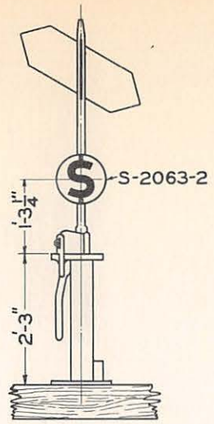
S-2062



S-2063-1 DISC WITH LETTER "S" ONLY

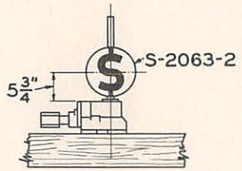
S-2063-2 MARKER COMPLETE WITH TWO S-2063-1 DISCS AND TWO 3/8" X 2" U. S. ST'D. SQ. HD. BOLTS, HEX. NUTS, FOUR FLAT LEAD WASHERS, AND TWO 1/8" X 3/32" SPRING WASHERS. SEE NOTE 4.

SCALE (1)



APPLICATION OF MARKER ON HIGH SWITCH STAND

SCALE (2)



APPLICATION OF MARKER ON LOW SWITCH STAND

SCALE (2)

NOTES

1. MARKER SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1552, RAILROAD HIGHWAY CROSSING SIGNAL SIGNS, EXCEPT AS OTHERWISE SHOWN.
2. MARKER SHALL CONSIST OF TWO DISCS, ATTACHED TO SWITCH STAND AT RIGHT ANGLES TO TRACK AND SHALL BE OBSERVED FROM TRAILING OR FACING POINT SIDE OF SWITCH WHEN IN NORMAL POSITION. THE NORMAL POSITION OF SPRING SWITCHES WILL BE DESIGNATED BY SPECIAL INSTRUCTIONS.
3. FOR DETAIL OF LETTER "S" SEE LATEST REVISION OF STANDARD DRAWING R-549, STANDARD LETTERS AND FIGURES FOR SIGNS.
4. BOLTS, NUTS, AND SPRING WASHERS SHALL BE CADMIUM PLATED.

SCALE IN INCHES

(1) 0 1 2 3 4

(2) 0 12 24 36 48

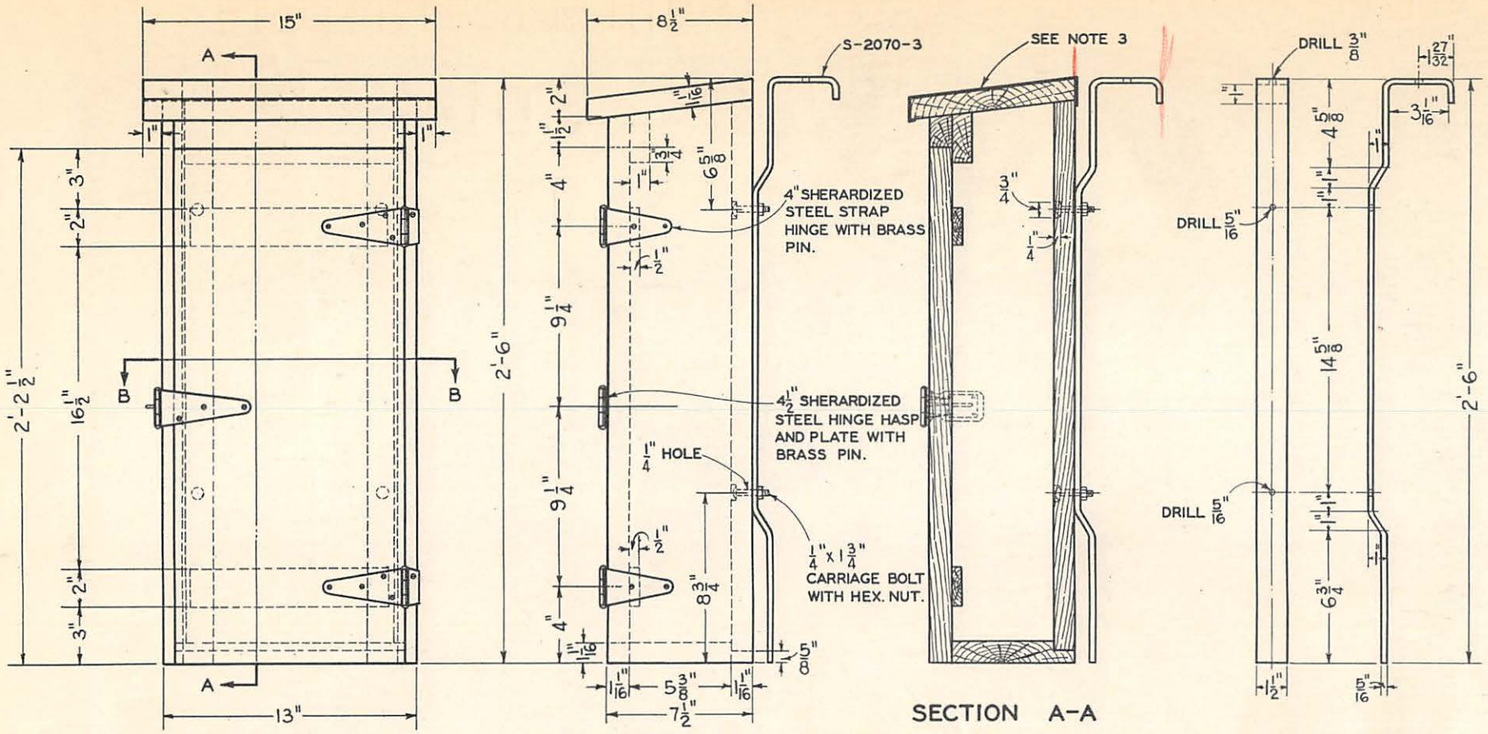
APPROVED FOR USE			
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT			
ERIE RAILROAD COMPANY — VICE PRESIDENT			
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT			
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT			
C. B. P.	C. B. P.	C. D. M.	A. J. P.

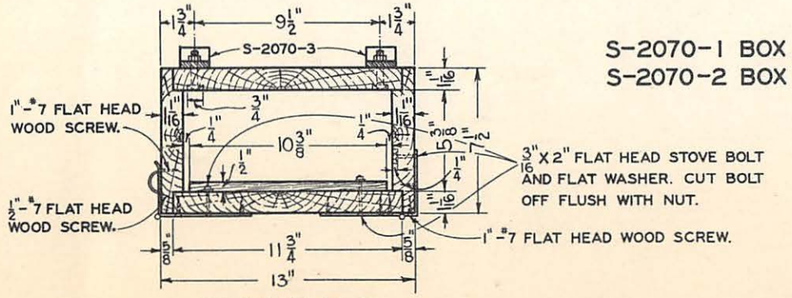
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD MARKER FOR SPRING SWITCHES

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: DEC. 14, 1933.
CHIEF ENGINEER

S-2063





S-2070-1 BOX COMPLETE WITH TWO STRAPS AND FOUR BOLTS
S-2070-2 BOX ONLY

NOTES

1. BOX SHALL BE MADE OF AIR SEASONED NO. 1 COMMON WHITE PINE. NO SPLITS WILL BE PERMITTED IN THE FINISHED PRODUCT. BOX SHALL BE WATER-TIGHT BEFORE PAINTING.
2. JOINTS SHALL BE LAID IN WHITE LEAD AND NAILED WITH CEMENT COATED NAILS, COUNTERSUNK.
3. TOP OF BOX SHALL BE COVERED WITH NO. 22 U. S. STANDARD GAGE GALVANIZED SHEET IRON. EDGES SHALL BE TURNED DOWN OVER JOINTS AND NAILED WITH CEMENT COATED NAILS.
4. WORKMANSHIP SHALL BE FIRST CLASS IN EVERY RESPECT.
5. NAIL HOLES SHALL BE PUTTIED AFTER FIRST COAT OF PAINT IS APPLIED.
6. BOX AND PARTS SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT THAT EXTERIOR SURFACES OF BOX SHALL HAVE PRIMING COAT OF WHITE LEAD AND TWO COATS OF BLACK PAINT.
7. USE 5/16" X 1 1/2" LAG SCREWS FOR FASTENING S-2070-3, STRAP, TO CROSS ARM.

SCALE IN INCHES
0 3 6 9 12

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

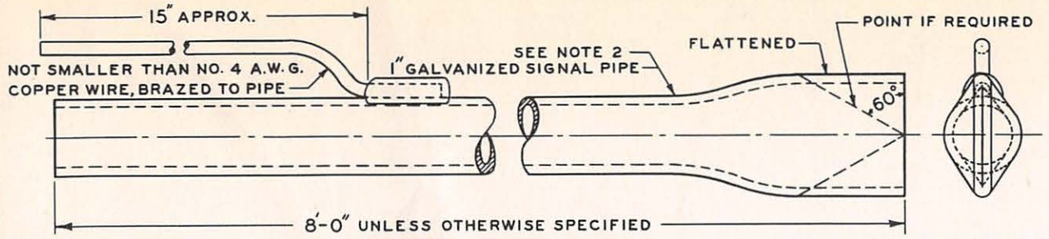
C.H.W. | C.D.M. | A.J.P.
C.S.L.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD LIGHTNING ARRESTER BOX

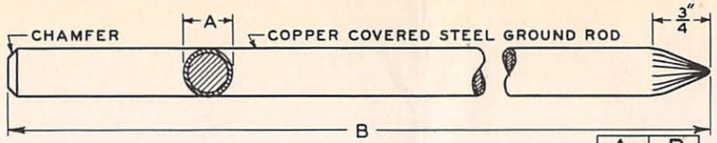
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: MAY 17, 1932.
CHIEF ENGINEER

S-2070



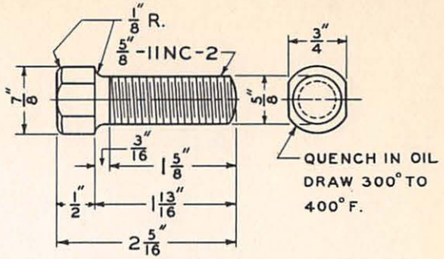
S-2075-1 GROUND ROD

NO SCALE



	A	B
S-2075-5 GROUND ROD ONLY	5/8"	8'-0"
S-2075-6 " " WITH CLAMP S-2075-2	"	"
S-2075-7 " " ONLY	5/8"	10'-0"
S-2075-8 " " WITH CLAMP S-2075-2	"	"
S-2075-9 " " ONLY	3/4"	6'-0"
S-2075-10 " " WITH CLAMP S-2075-3	"	"

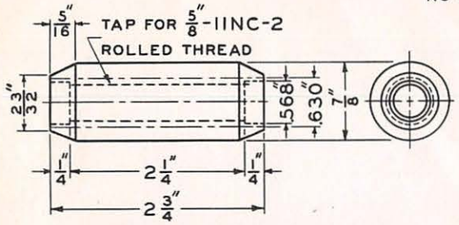
NO SCALE



S-2075-15 ROD DRIVER

CARBON STEEL (S.A.E. 1045)

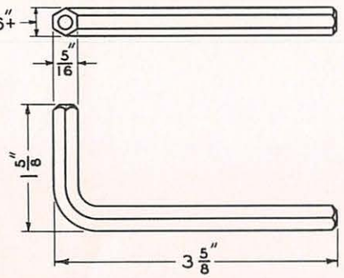
NO SCALE



S-2075-14 COUPLING

BRONZE

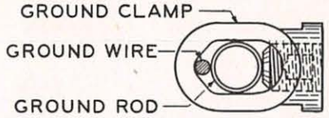
NO SCALE



S-2075-4 WRENCH FOR GROUND CLAMPS

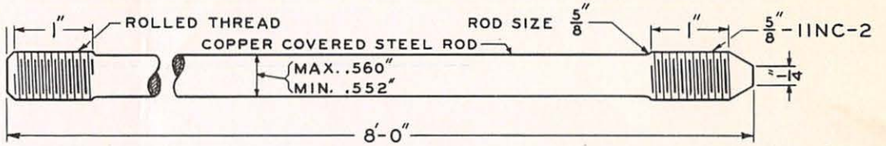
TOOL STEEL

NO SCALE



ASSEMBLY

NO SCALE



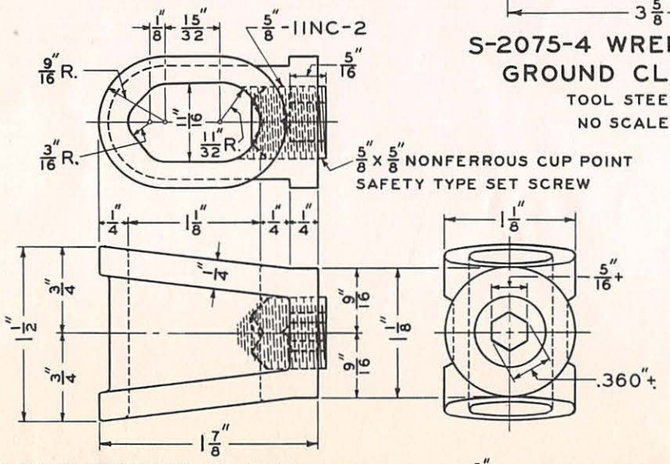
S-2075-11 SECTIONAL GROUND ROD ONLY

S-2075-12 " " " WITH CLAMP S-2075-2

S-2075-13 " " " WITH COUPLING S-2075-14

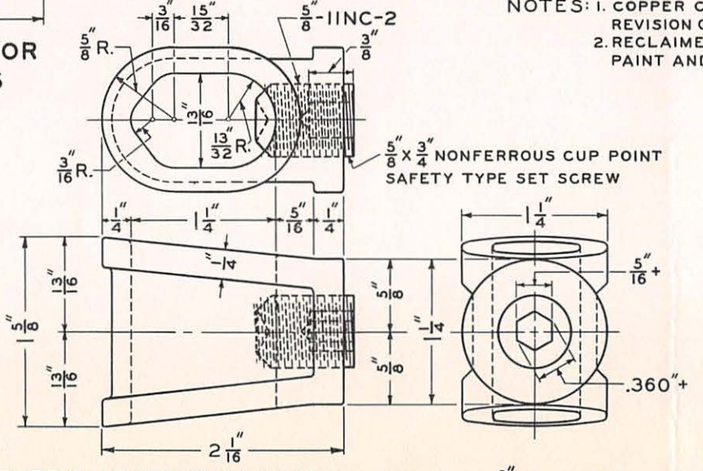
NO SCALE

NOTES: 1. COPPER COVERED STEEL GROUND RODS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1557, COPPER COVERED STEEL GROUND RODS.
2. RECLAIMED SIGNAL PIPE, IF IN GOOD CONDITION, MAY BE USED WHEN FREE FROM PAINT AND GREASE.



S-2075-2 GROUND CLAMP COMPLETE FOR 5/8" DIA. GROUND ROD

NONFERROUS METAL



S-2075-3 GROUND CLAMP COMPLETE FOR 3/4" DIA. GROUND ROD

NONFERROUS METAL

SCALE IN INCHES

0 1 2

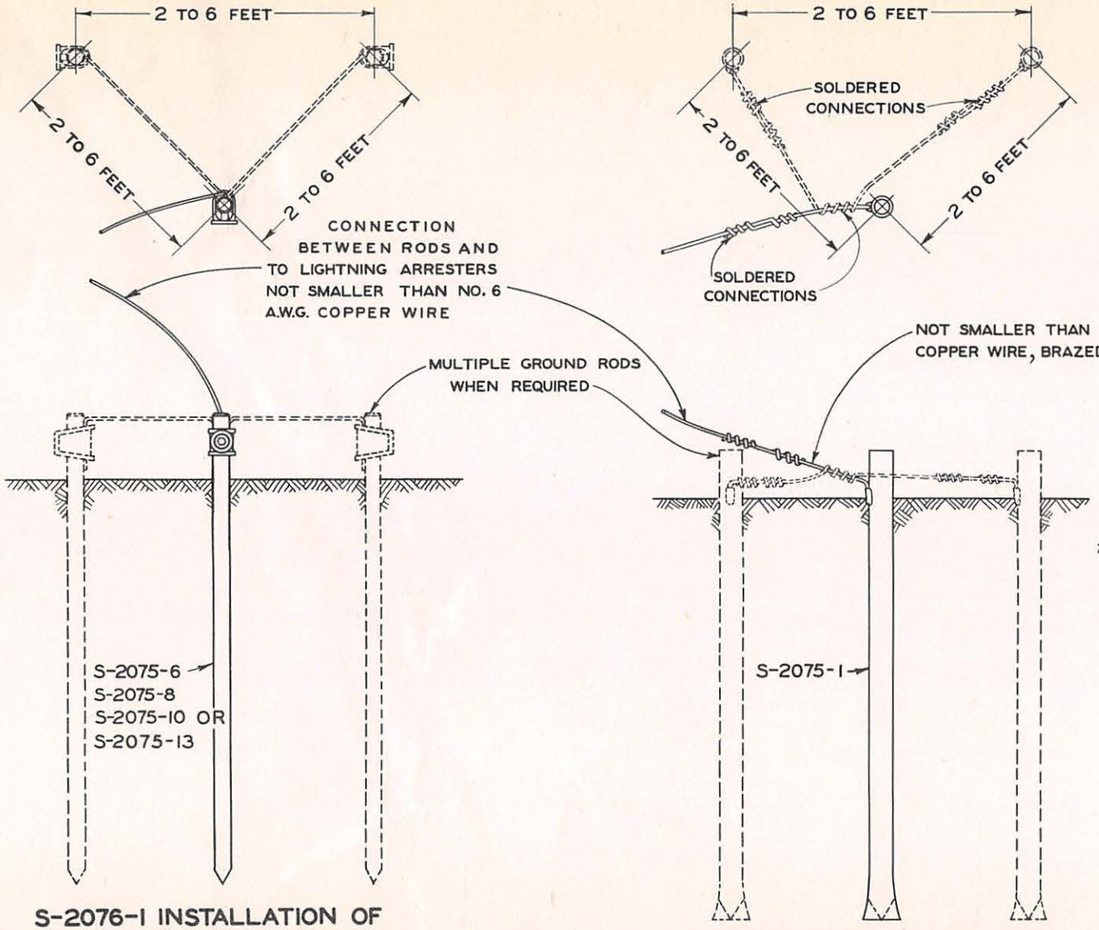
APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — EXECUTIVE VICE PRESIDENT		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT AND GEN. MANAGER		
W.S.E.	W.S.E.	W.N.H.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD GROUND RODS AND CLAMPS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
CHAIRMAN

JAN. 20 1947


2 TO 6 FEET
2 TO 6 FEET
2 TO 6 FEET
CONNECTION BETWEEN RODS AND TO LIGHTNING ARRESTERS NOT SMALLER THAN NO. 6 A.W.G. COPPER WIRE
MULTIPLE GROUND RODS WHEN REQUIRED
S-2075-6
S-2075-8
S-2075-10 OR
S-2075-13

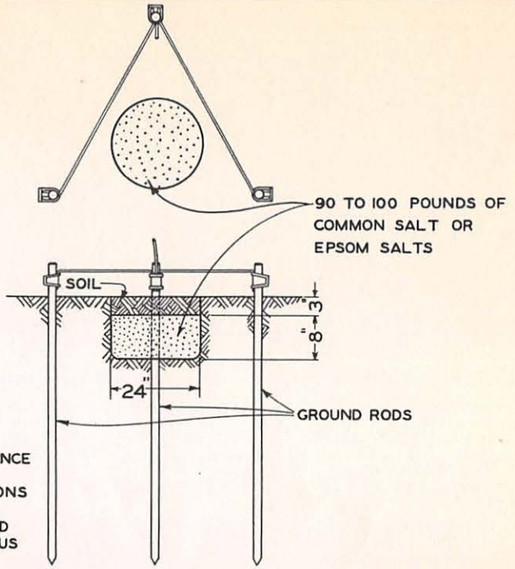
S-2076-1 INSTALLATION OF COPPER COVERED STEEL GROUND ROD

2 TO 6 FEET
SOLDERED CONNECTIONS
2 TO 6 FEET
2 TO 6 FEET
SOLDERED CONNECTIONS
NOT SMALLER THAN NO. 4 A.W.G. COPPER WIRE, BRAZED TO PIPE
S-2075-1

S-2076-2 INSTALLATION OF GALVANIZED SIGNAL PIPE GROUND ROD

NOTES

1. INSTALLATION OF GROUND RODS AND TREATMENT OF SOIL SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1906, FIELD SPECIFICATIONS INCLUDING INSTRUCTIONS FOR INSTALLING, TESTING, AND MAINTAINING GROUNDS USED FOR THE PROTECTION OF SIGNAL APPARATUS AGAINST LIGHTNING.
2. BEFORE DRIVING, SEVERAL TURNS OF FRICTION TAPE SHALL BE PLACED AROUND ROD S-2075-1 AND GROUND WIRE AT POINT BRAZED TO PREVENT BREAKAGE OF WIRE.



S-2076-3 METHOD OF SOIL TREATMENT

NO SCALE

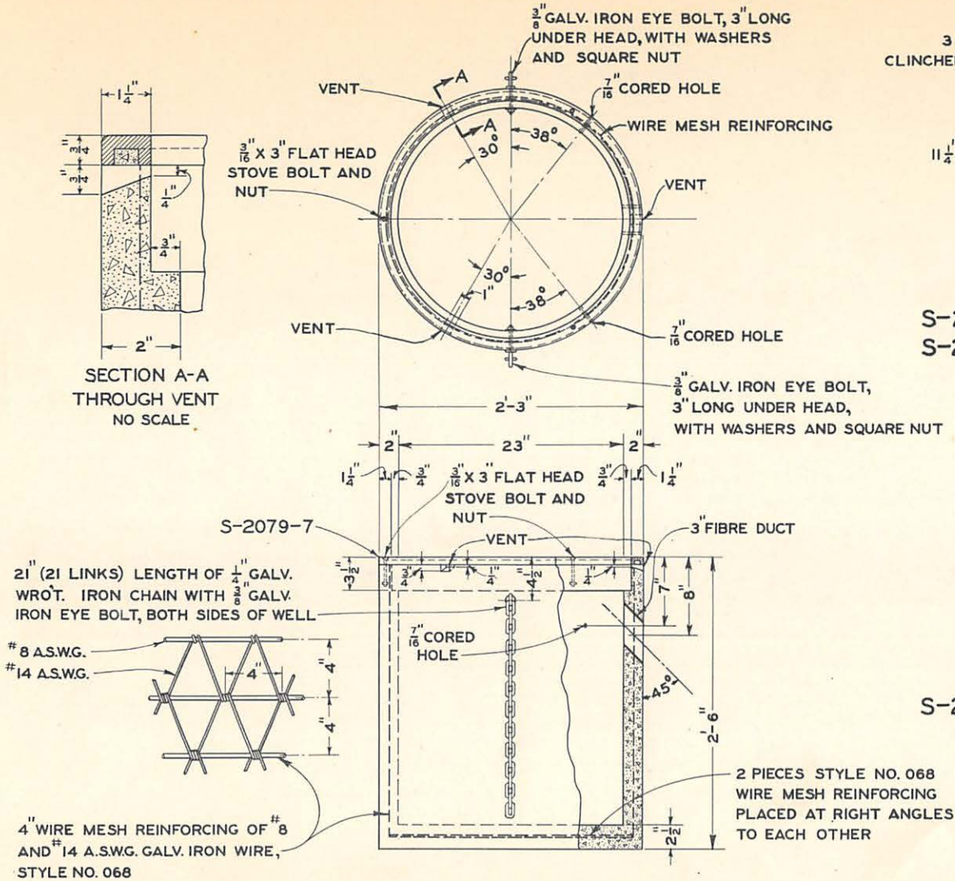
APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY H.H. Cammaster EXECUTIVE VICE PRESIDENT		
ERIE RAILROAD COMPANY H.W. Barber VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY J.W. Davis PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY M.M. Crank VICE PRES. AND GEN. MANG'R		
C.B.P. K.L.M.	W.S.E.	W.N.H.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD GROUND ROD INSTALLATION AND METHOD OF SOIL TREATMENT

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
H. Wallace
CHAIRMAN
JAN. 7, 1947

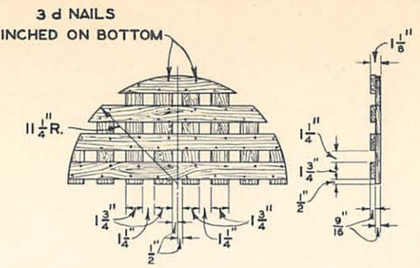
S-2076-A



S-2079-5 SIX CELL BATTERY WELL ONLY

STONE IN AGGREGATE SHALL NOT EXCEED 3/4"

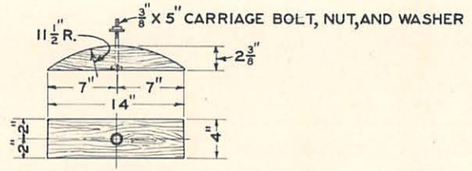
SCALE (1)



S-2079-2 SLAT FLOOR SECTION
S-2079-3 SLAT FLOOR COMPLETE (2 SECTIONS)

PINE, #2 COMMON

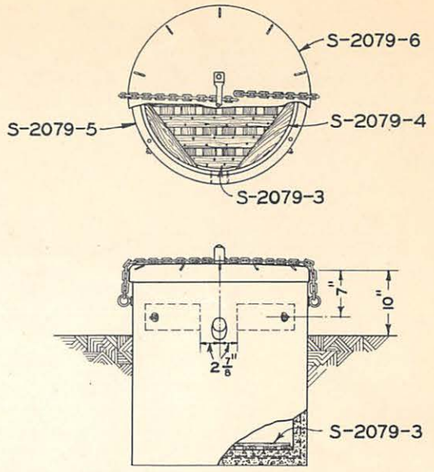
SCALE (1)



S-2079-4 TERMINAL BOARD

PINE, #2 COMMON

SCALE (1)



S-2079-1 SIX CELL BATTERY WELL COMPLETE

SCALE (2)

SCALE IN INCHES

(1) 0 3 6 9 12 24

(2) 0 3 6 9 12 24 36

NOTES

1. BATTERY WELL SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 3000 POUNDS PER SQUARE INCH.
2. METALLIC PARTS, NOT GALVANIZED, SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. TERMINAL BOARDS AND SLAT FLOOR SHALL BE FURNISHED PAINTED TWO COATS OF INSULATING PAINT.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D. B. Brooks
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
R. C. Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
A. W. Clem
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
R. H. Bowman
VICE PRESIDENT

C.B.P.	C.D.M.	A.J.P.
K.L.M.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

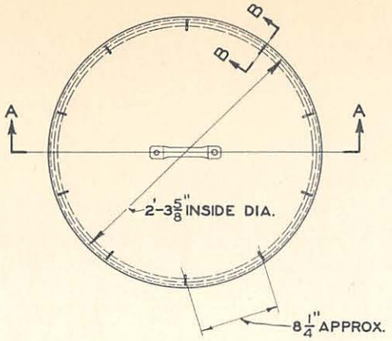
STANDARD SIX CELL CONCRETE BATTERY WELL

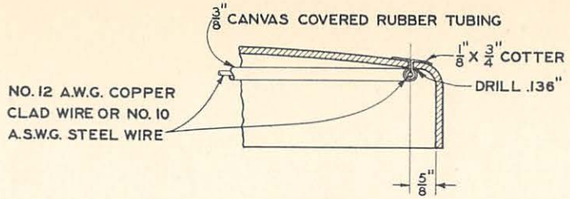
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: A. Trumbel — CHIEF ENGINEER — AUG. 16, 1932.

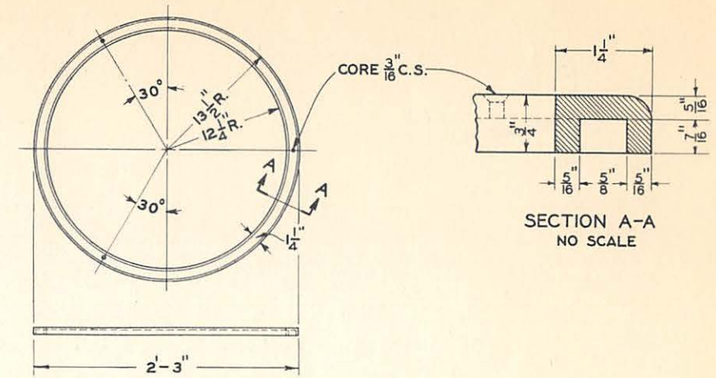
SHEET 1 OF 2

S-2079



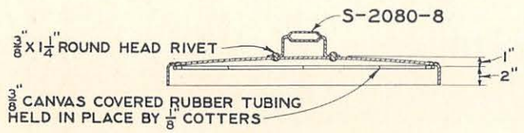


SECTION B–B
NO SCALE



SECTION A–A
NO SCALE

S-2079-7 TOP RING
CAST IRON



SECTION A–A

S-2079-6 COVER COMPLETE
#10 U.S. STANDARD GAGE STEEL, PRESSED

NOTES

1. METALLIC PARTS SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. METAL COVER SHALL BE PRESSED FROM PLATE, FREE FROM DEFECTS AND IN ONE PIECE.

SCALE IN INCHES
0 3 6 8 12 24

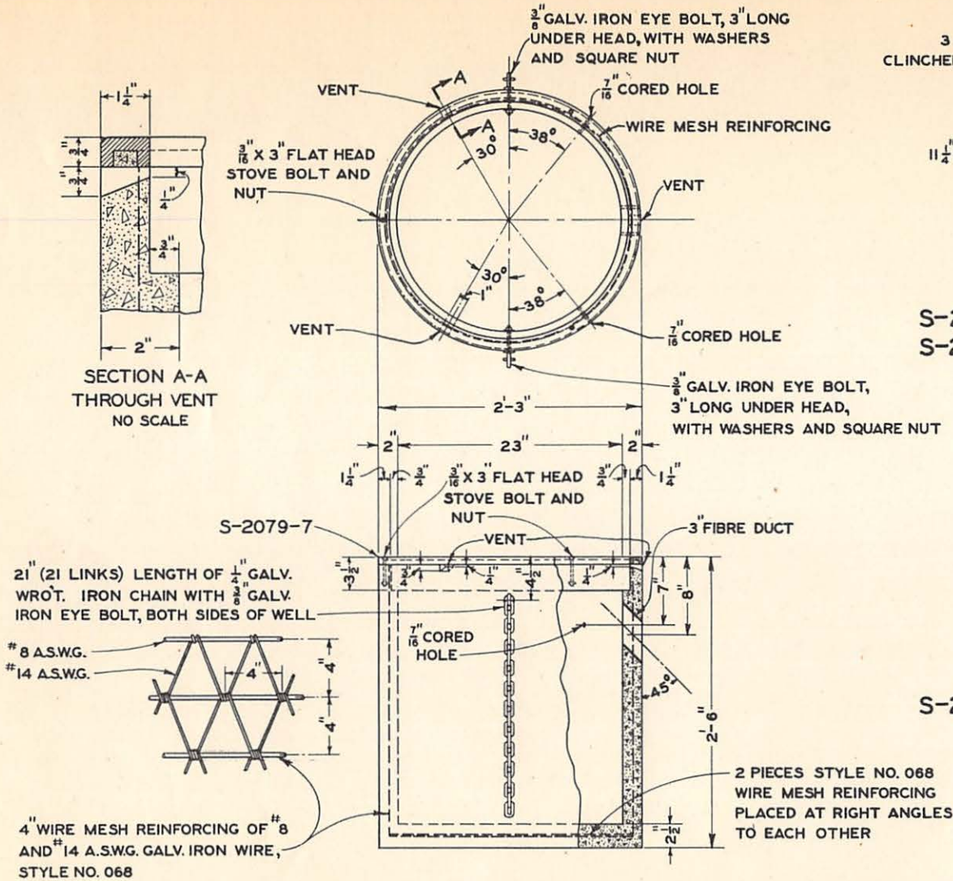
APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY D Booth VICE PRESIDENT AND GENERAL MANAGER	
ERIE RAILROAD COMPANY R Kellwoodcuff VICE PRESIDENT	
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY H Beam VICE PRESIDENT	
PERE MARQUETTE RAILWAY COMPANY R Bowman VICE PRESIDENT	
C. B. P.	C.D.M. A.J.P.
K. L.M.	

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD
SIX CELL CONCRETE BATTERY WELL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E Ruschel CHIEF ENGINEER AUG. 16, 1932.

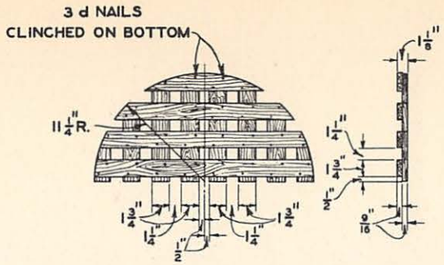
SHEET 2 OF 2
S-2079



S-2079-5 SIX CELL BATTERY WELL ONLY

STONE IN AGGREGATE SHALL NOT EXCEED 3/4"

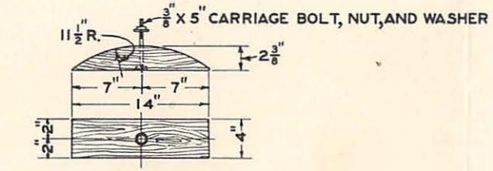
SCALE (1)



S-2079-2 SLAT FLOOR SECTION
S-2079-3 SLAT FLOOR COMPLETE (2 SECTIONS)

PINE, #2 COMMON

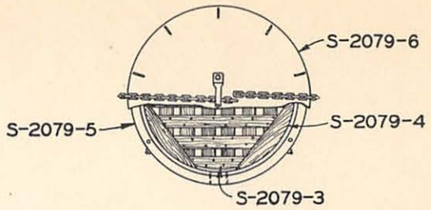
SCALE (1)

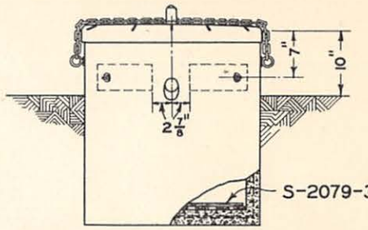


S-2079-4 TERMINAL BOARD

PINE, #2 COMMON

SCALE (1)





S-2079-1 SIX CELL BATTERY WELL COMPLETE

SCALE (2)

SCALE IN INCHES

(1) 0 3 6 9 12 24

(2) 0 3 6 9 12 24 36

NOTES

1. BATTERY WELL SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 3000 POUNDS PER SQUARE INCH.
2. METALLIC PARTS, NOT GALVANIZED, SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. TERMINAL BOARDS AND SLAT FLOOR SHALL BE FURNISHED PAINTED TWO COATS OF INSULATING PAINT.
4. SECTIONALIZED CONCRETE BATTERY BOX MAY BE SUBSTITUTED UPON APPROVAL.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H.A. Commaster
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
N.D. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
S.M. Davis
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
R.H. Bowman
PRESIDENT

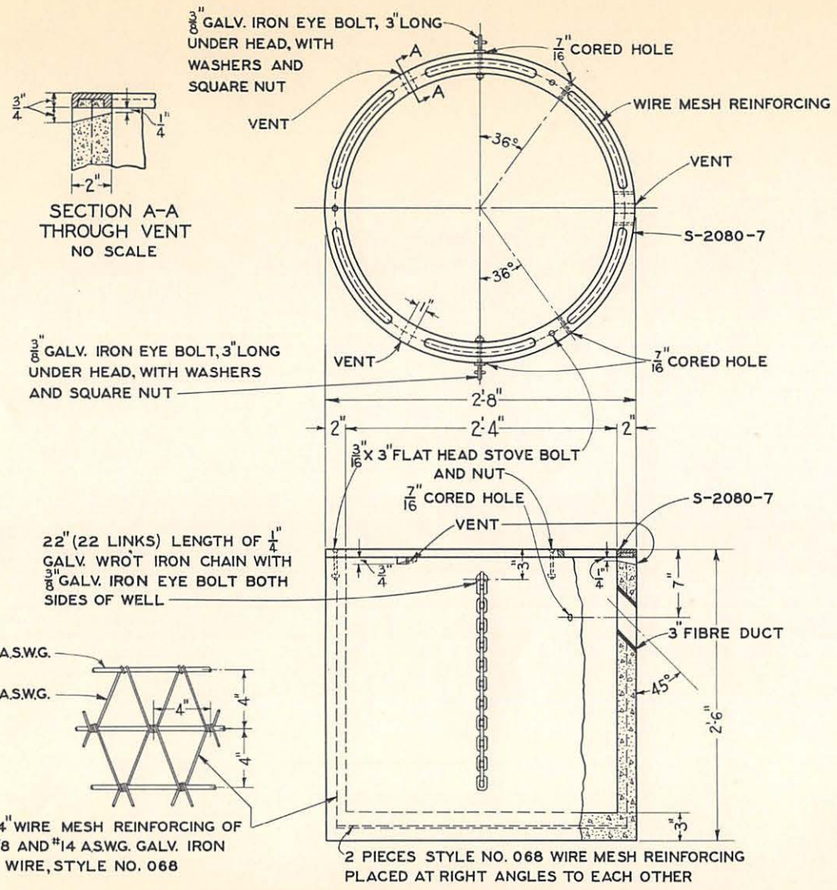
C.B.P.	W.S.E.	W.N.H.
K.L.M.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD
SIX CELL CONCRETE BATTERY WELL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
SEPT. 14, 1944
J.E. Wallace
CHAIRMAN

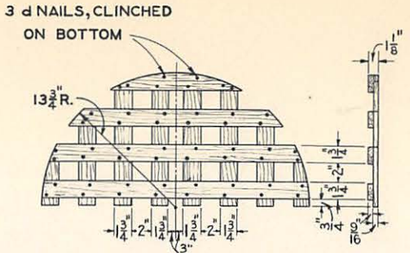
SHEET 1 OF 2
S-2079-A

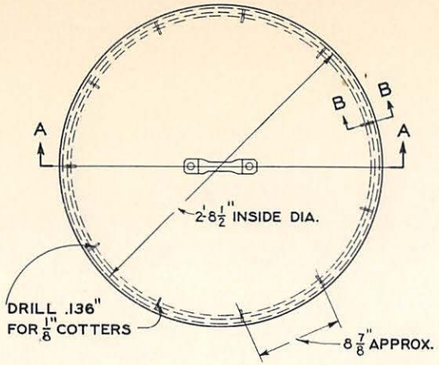


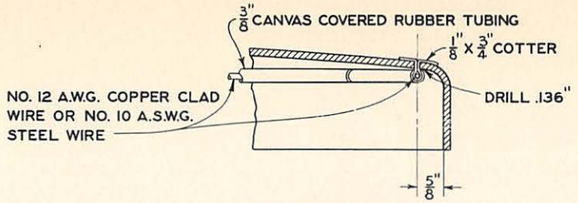
SECTION A-A
THROUGH VENT
NO SCALE

S-2080-5 TEN CELL BATTERY WELL ONLY

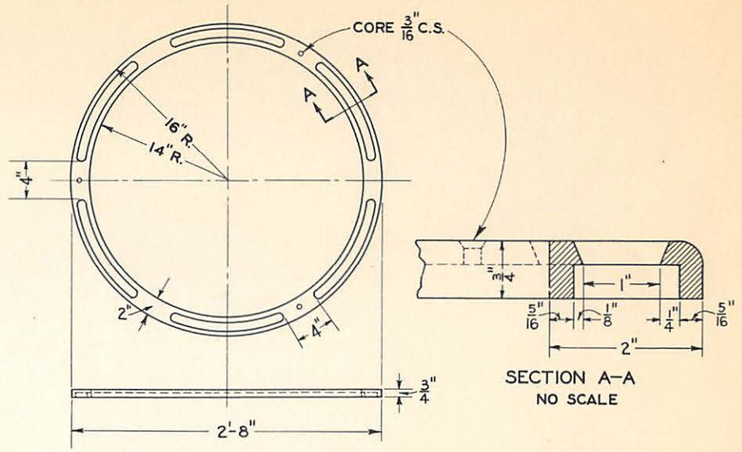
STONE IN AGGREGATE SHALL NOT EXCEED 4" 1/2
SCALE (1)


3 d NAILS, CLINCHED ON BOTTOM
13 3/4" R.
1 1/8"
2"
2"
2"
2"
3/4"
3/4"
3/4



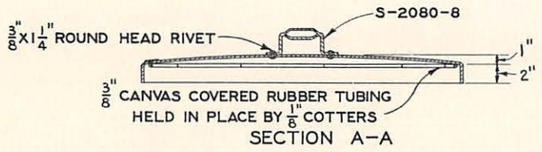


SECTION B-B
NO SCALE



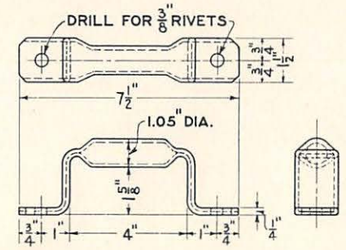
SECTION A-A
NO SCALE

S-2080-7 TOP RING
CAST IRON
SCALE (1)



SECTION A-A

S-2080-6 COVER COMPLETE
#10 U.S. STANDARD GAGE STEEL, PRESSED
SCALE (1)



S-2080-8 HANDLE
3/4" WROUGHT IRON PIPE (1.05" O.D.)
SCALE (2)

NOTES

1. METALLIC PARTS SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. METAL COVER SHALL BE PRESSED FROM PLATE, FREE FROM DEFECTS AND IN ONE PIECE.

SCALE IN INCHES

(1) 0 3 6 9 12 24

(2) 0 1 2 3 4 5 6 7 8

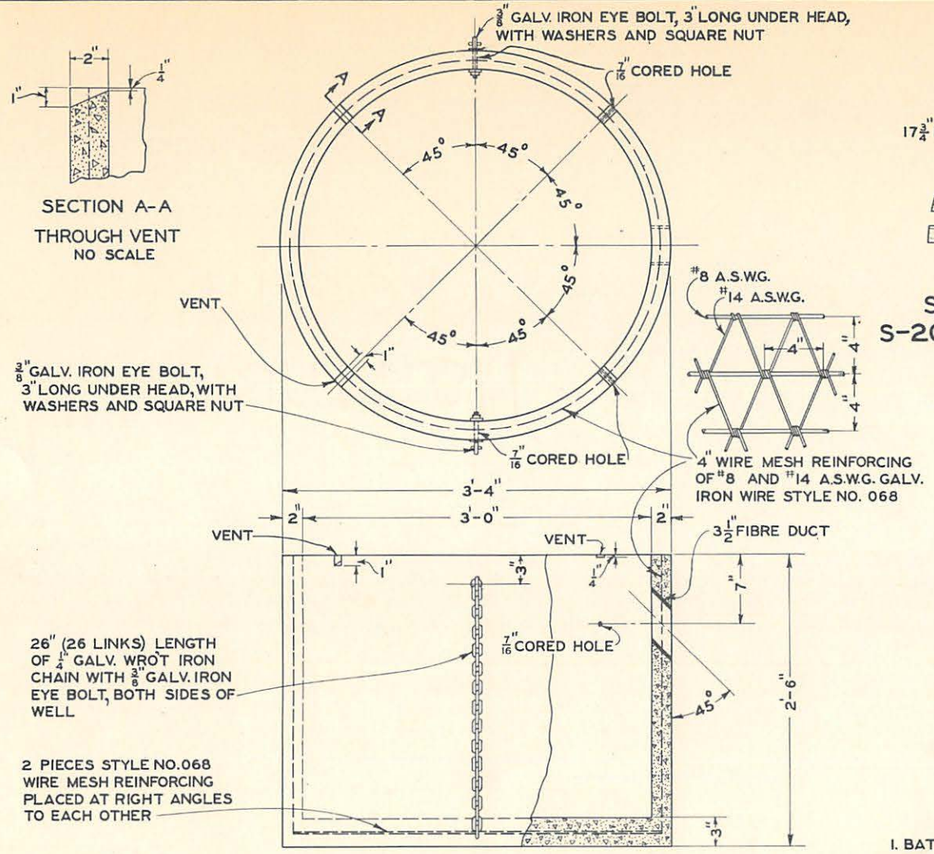
APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT AND GENERAL MANAGER		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT		
C. B. P. K. L. M.	C. D. M.	A. J. P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD TEN CELL CONCRETE BATTERY WELL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: MAY 17, 1932.
CHIEF ENGINEER

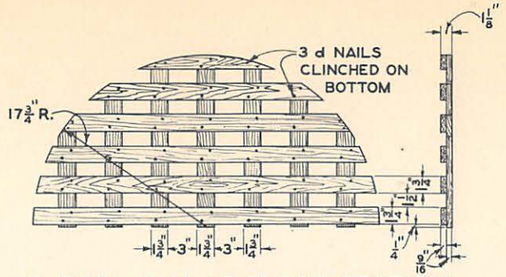
SHEET 2 OF 2
S-2080


SECTION A-A
THROUGH VENT
NO SCALE
⅝" GALV. IRON EYE BOLT, 3" LONG UNDER HEAD, WITH WASHERS AND SQUARE NUT
7/16" CORED HOLE
VENT
⅜" GALV. IRON EYE BOLT, 3" LONG UNDER HEAD, WITH WASHERS AND SQUARE NUT
#8 A.S.W.G.
#14 A.S.W.G.
4" WIRE MESH REINFORCING OF #8 AND #14 A.S.W.G. GALV. IRON WIRE STYLE NO. 068
3'-4"
3'-0"
3½" FIBRE DUCT
26" (26 LINKS) LENGTH OF ¼" GALV. WROT IRON CHAIN WITH ⅜" GALV. IRON EYE BOLT, BOTH SIDES OF WELL
2 PIECES STYLE NO. 068 WIRE MESH REINFORCING PLACED AT RIGHT ANGLES TO EACH OTHER
2'-6"

S-2081-5 SIXTEEN CELL BATTERY WELL ONLY

STONE IN AGGREGATE SHALL NOT EXCEED 2½"

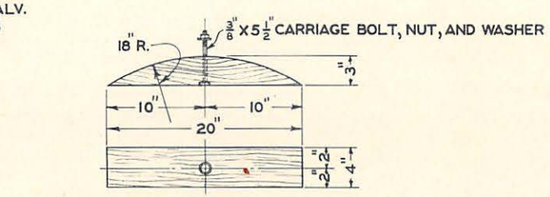
SCALE ①



S-2081-2 SLAT FLOOR SECTION
S-2081-3 SLAT FLOOR COMPLETE (2 SECTIONS)

PINE, #2 COMMON

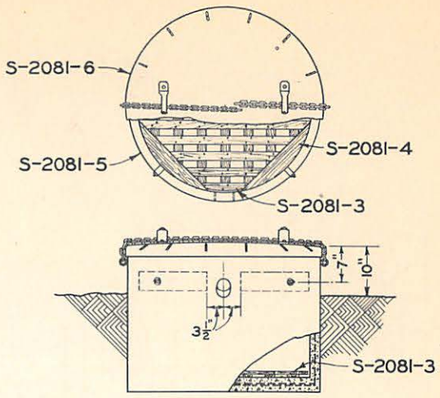
SCALE ①



S-2081-4 TERMINAL BOARD

PINE, #2 COMMON

SCALE ①



S-2081-1 SIXTEEN CELL BATTERY WELL COMP.

SCALE ②

NOTES

1. BATTERY WELL SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 3000 POUNDS PER SQUARE INCH.
2. METALLIC PARTS, NOT GALVANIZED, SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. TERMINAL BOARDS AND SLAT FLOOR SHALL BE FURNISHED PAINTED TWO COATS OF INSULATING PAINT.

SCALE IN INCHES

① 0 3 6 9 12 24

② 0 6 12 24 36 48

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Brooke — VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY — K E Woodruff — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

C. B. P.		
K. L. M.	C. D. M.	A. J. P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

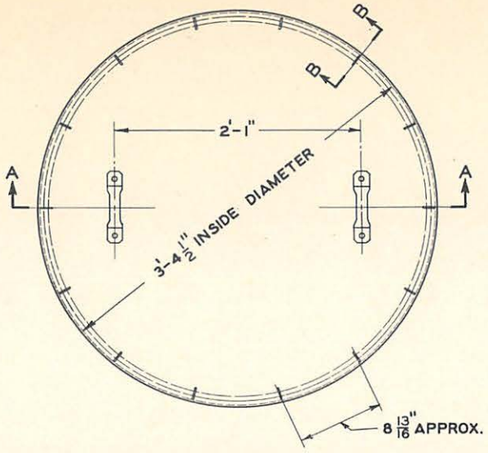
SIXTEEN CELL CONCRETE BATTERY WELL

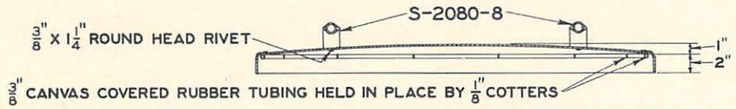
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: E T Nichol, CHIEF ENGINEER — AUG. 16, 1932.

SHEET 1 OF 2

S-2081

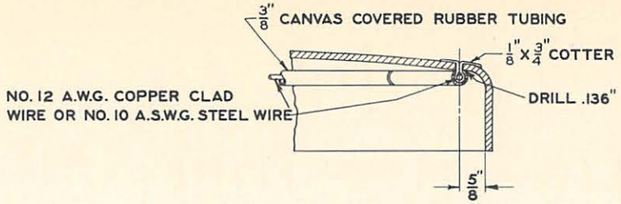




SECTION A-A

S-2081-6 COVER COMPLETE

#10 U.S. STANDARD GAGE STEEL, PRESSED



SECTION B-B

NO SCALE

NOTES

1. METAL COVER SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. METAL COVER SHALL BE PRESSED FROM PLATE, FREE FROM DEFECTS AND IN ONE PIECE.

SCALE IN INCHES

0 3 6 9 12 24

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT AND GENERAL MANAGER		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT		
C. B. P.	C. D.M.	A. J.P.
K. L.M.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

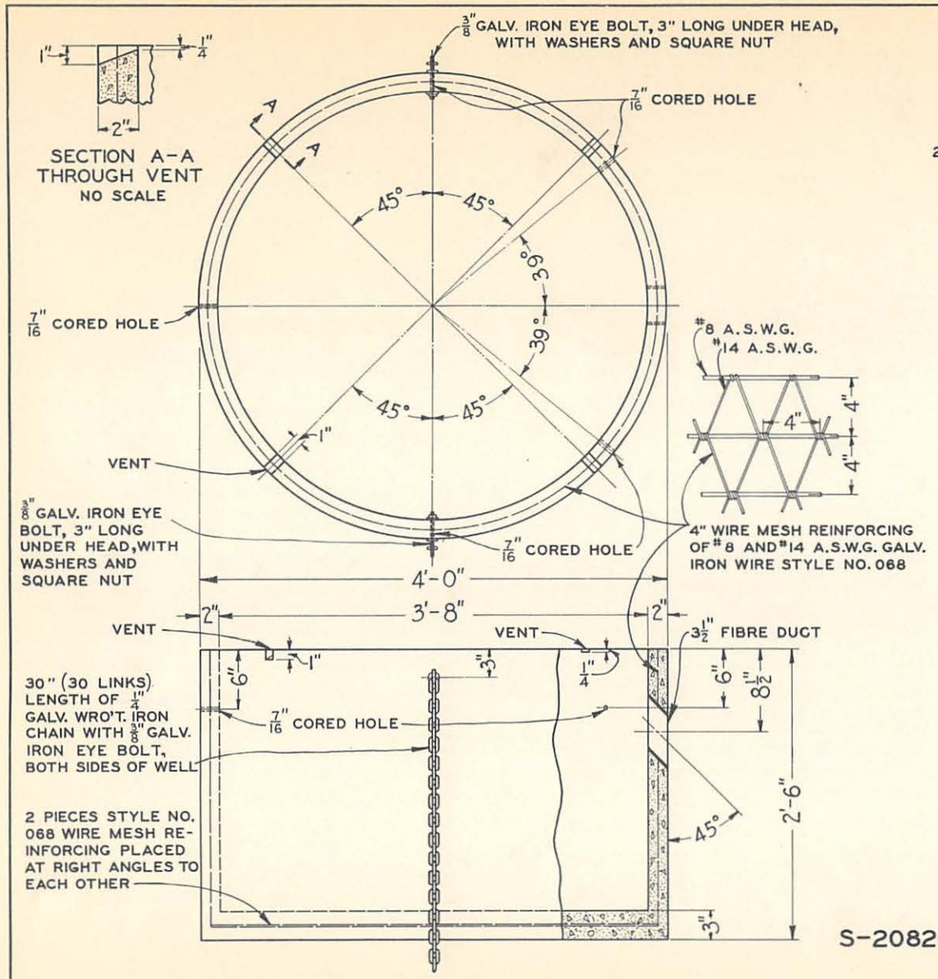
SIXTEEN CELL CONCRETE BATTERY WELL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: AUG. 16, 1932.
CHIEF ENGINEER

SHEET 2 OF 2

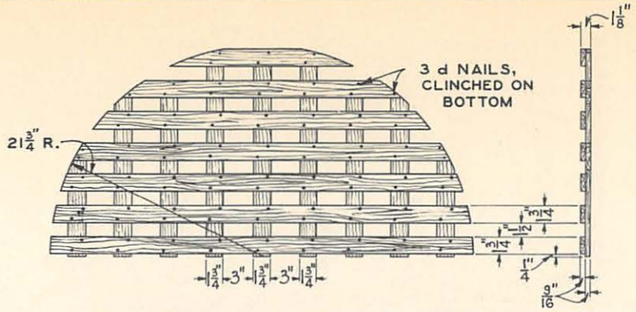
S-2081


3/8" GALV. IRON EYE BOLT, 3" LONG UNDER HEAD, WITH WASHERS AND SQUARE NUT
7/16" CORED HOLE
SECTION A-A THROUGH VENT
NO SCALE
45°
39°
VENT
3/8" GALV. IRON EYE BOLT, 3" LONG UNDER HEAD, WITH WASHERS AND SQUARE NUT
#8 A.S.W.G.
#14 A.S.W.G.
4"
4" WIRE MESH REINFORCING OF #8 AND #14 A.S.W.G. GALV. IRON WIRE STYLE NO. 068
4'-0"
3'-8"
2"
1"
3½" FIBRE DUCT
6"
8½"
30" (30 LINKS) LENGTH OF 1/4" GALV. WRO'T. IRON CHAIN WITH 3/8" GALV. IRON EYE BOLT, BOTH SIDES OF WELL
2 PIECES STYLE NO. 068 WIRE MESH REINFORCING PLACED AT RIGHT ANGLES TO EACH OTHER
2'-6"

S-2082-5 TWENTY-FOUR CELL BATTERY WELL ONLY

STONE IN AGGREGATE SHALL NOT EXCEED 3/4"

SCALE ①

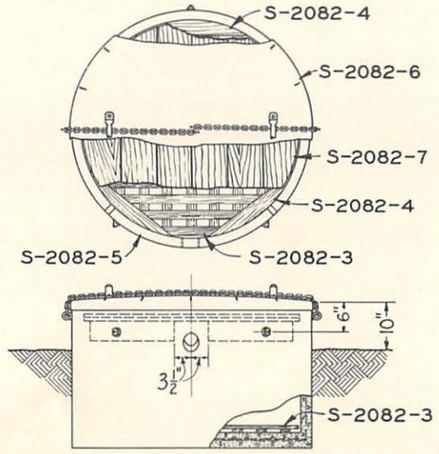


S-2082-2 SLAT FLOOR SECTION

S-2082-3 SLAT FLOOR COMPLETE (2 SECTIONS)

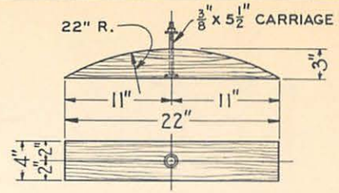
PINE, #2 COMMON

SCALE ①



S-2082-1 TWENTY-FOUR CELL BATTERY WELL COMP.

SCALE ②



S-2082-4 TERMINAL BOARD

PINE, #2 COMMON

SCALE ①

NOTES

1. BATTERY WELL SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 3000 POUNDS PER SQUARE INCH.
2. METALLIC PARTS, NOT GALVANIZED, SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. TERMINAL BOARDS, FROST COVER, AND SLAT FLOOR SHALL BE FURNISHED PAINTED TWO COATS OF INSULATING PAINT.

SCALE IN INCHES

① 0 3 6 9 12 24

② 0 3 6 9 12 24 36 48

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

C. B. P.	C. D. M.	A. J. P.
C. B. P.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

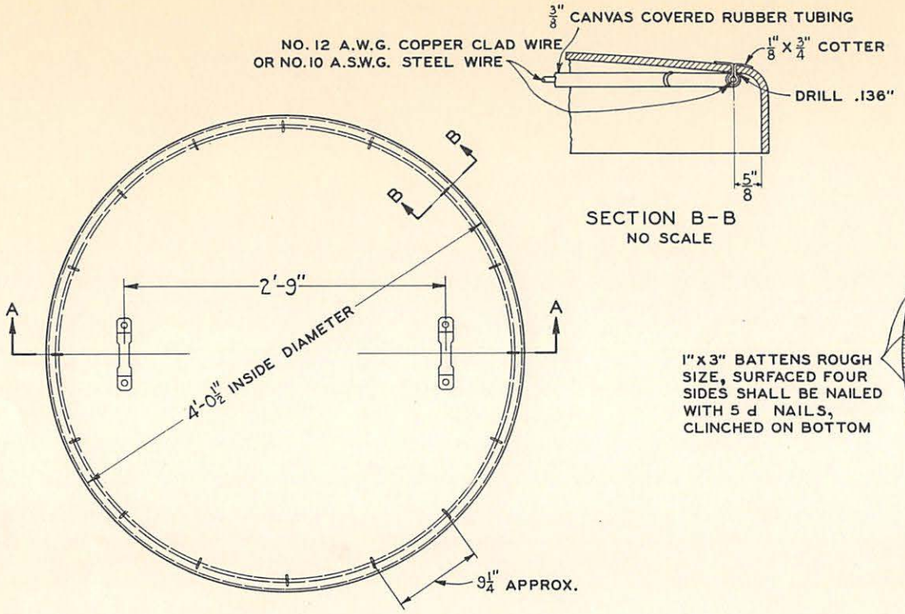
TWENTY-FOUR CELL CONCRETE BATTERY WELL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: MAY 17, 1932.
CHIEF ENGINEER

SHEET 1 OF 2

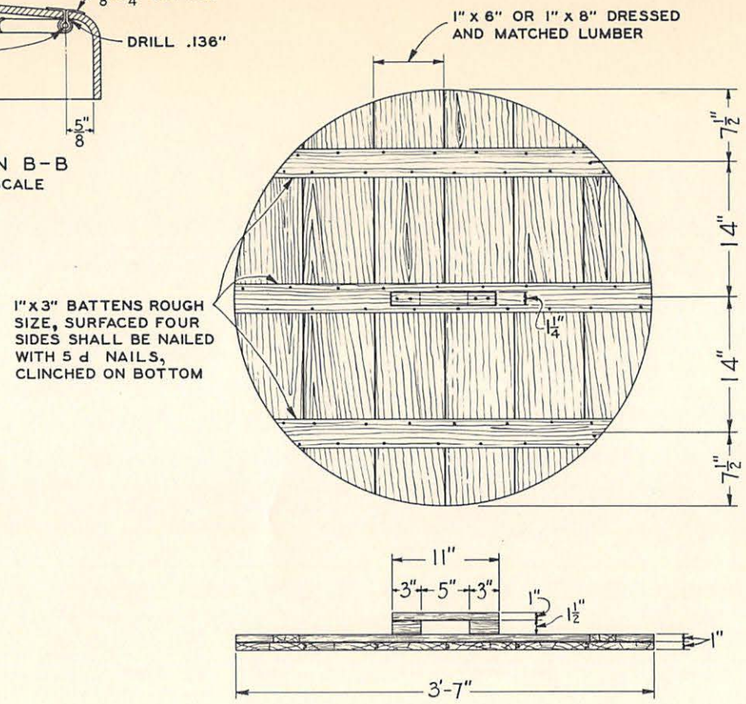
S-2082



SECTION B-B
NO SCALE

SECTION A-A

S-2082-6 COVER COMPLETE
#7 U.S. STANDARD GAGE STEEL, PRESSED



S-2082-7 WOOD FROST COVER
PINE, #2 COMMON

NOTES

1. METAL COVER SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. FROST COVER SHALL BE FURNISHED PAINTED TWO COATS OF INSULATING PAINT.
3. METAL COVER SHALL BE PRESSED FROM PLATE, FREE FROM DEFECTS AND IN ONE PIECE.

SCALE IN INCHES.
0 3 6 9 12 24

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D. B. Brooks
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
R. H. Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
A. H. Smith
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
J. H. Bowman
VICE PRESIDENT

C. B. P.	C. D.M.	A. J. P.
C. B. P.		

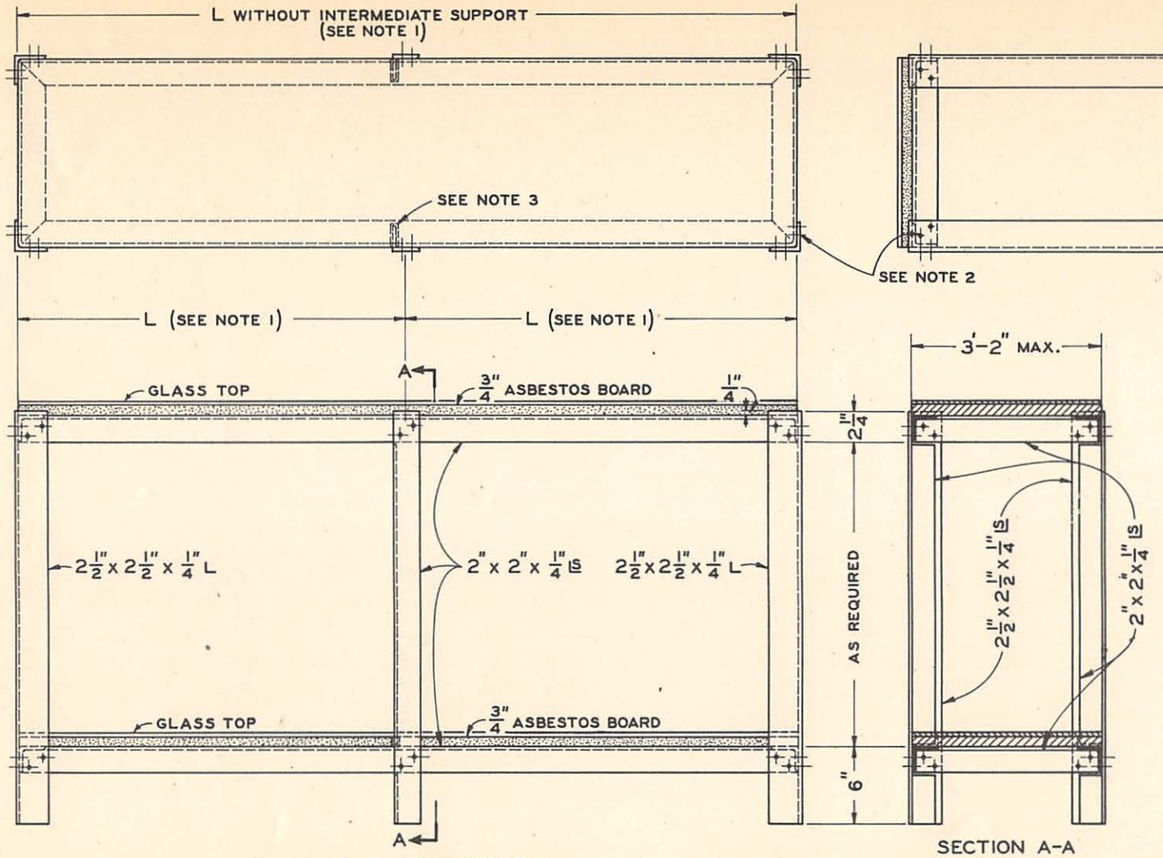
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

TWENTY-FOUR CELL CONCRETE BATTERY WELL

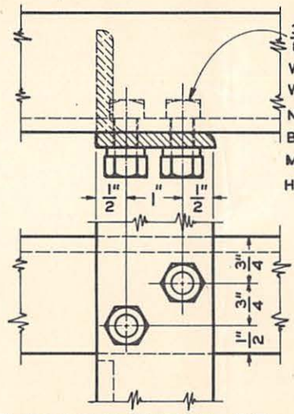
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E. Duncan MAY 17, 1932.
CHIEF ENGINEER

SHEET 2 OF 2
S-2082

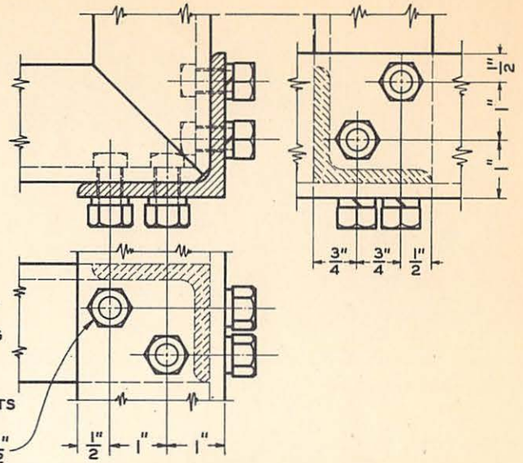


S-2083-1 BATTERY RACK

CAPACITY OF RACK SHALL BE DETERMINED BY LOCAL REQUIREMENTS


3/8" x 1" SQ. HD. BOLT WITH 1/8" x 1/8" SPRING WASHER AND HEX. NUT OR 3/8" x 1 1/4" BUTTON HEAD RIVETS MAY BE USED. ALL HOLES SHALL BE 13/32"
1/2"
1"
1/2"
3/4"
3/4"
1/2"

S-2083-2 DETAIL OF INTERMEDIATE SUPPORT



S-2083-3 DETAIL OF CORNER SUPPORT

SECTION A-A

NO SCALE

NOTES

1. L = 5'-0" MAXIMUM FOR MAXIMUM UNIFORMLY DISTRIBUTED LOAD OF 342 POUNDS PER LINEAL FOOT. L = 6'-6" MAXIMUM FOR MAXIMUM UNIFORMLY DISTRIBUTED LOAD OF 171 POUNDS PER LINEAL FOOT.
2. ANGLE IRON CONNECTIONS MAY BE WELDED, RIVETED, OR BOLTED.
3. LOWER ASBESTOS BOARD SHALL BE NOTCHED AS SHOWN, TO FIT FREELY AROUND INTERMEDIATE SUPPORTING ANGLE WHEN USED.
4. ALL PARTS OF BATTERY RACK SHALL BE PAINTED WITH ACID RESISTING PAINT.
5. TOP OF ASBESTOS BOARDS SHALL BE PAINTED LIGHT GRAY.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
K. D. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
PRESIDENT

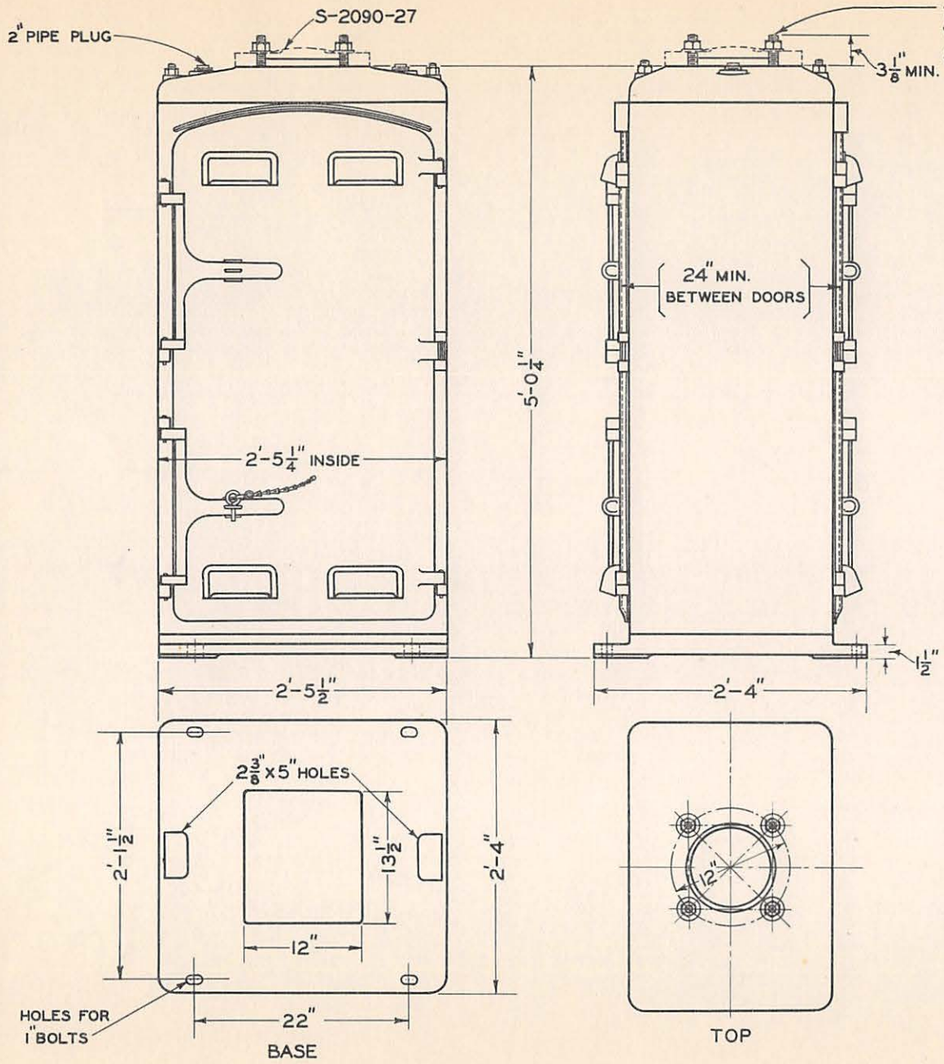
K. L. M.	W. S. E.	W. N. H.
C. B. P.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD BATTERY RACK

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. W. Wallace
CHAIRMAN
JUNE 28, 1944

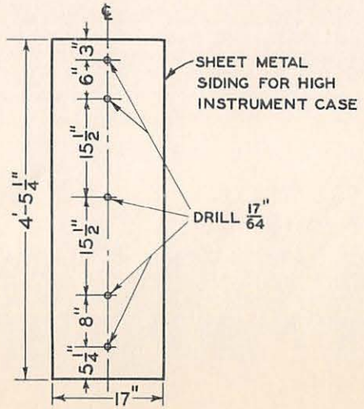
S-2083-A



NOTES

1. INSTRUMENT CASE SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT FINISHING COAT OF BLACK ON EXTERIOR SURFACES SHALL BE OMITTED.
2. INSTRUMENT CASE SHALL BE EQUIPPED WITH APPROVED ENCLOSED TYPE DOOR STOP WHICH MAY BE ARRANGED IN FIELD TO BE EFFECTIVE AT EITHER 90 DEGREE OR 180 DEGREE DOOR OPENING.

S-2090-13	INSTRUMENT CASE		ONLY WITH SHIPPING COVER
S-2090-14	"	"	WITH LINING S-2090-32 AND SHIPPING COVER
S-2090-15	"	"	ONLY WITH COVER S-2090-27
S-2090-16	"	"	WITH LINING S-2090-32 AND COVER S-2090-27
S-2090-17	"	"	" 2" CABLE OUTLET S-2090-22 WITH LINING S-2090-32 AND SHIPPING COVER
S-2090-18	"	"	ONLY WITH 2" CABLE OUTLET S-2090-22 AND SHIPPING COVER



TEMPLATE FOR DRILLING OF CASE FOR LINING
NO SCALE

SCALE IN INCHES
0 3 6 9 12 15 18 21 24

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Booth, VICE PRESIDENT		
ERIE RAILROAD COMPANY — R Kellwoodruff, VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D Booth, VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — A Bowman, VICE PRESIDENT		
C. H. W. K. L. M.	C. D. M.	A. J. P.

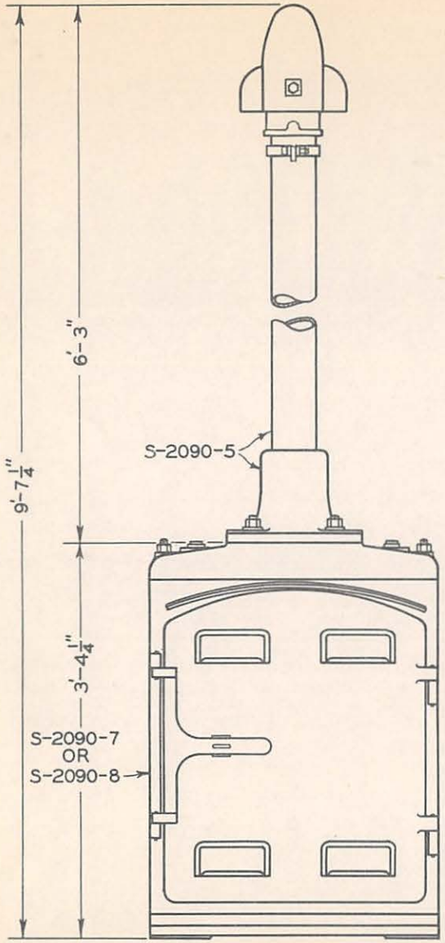
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD INSTRUMENT CASE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E T Howard, CHIEF ENGINEER — JUNE 27, 1933

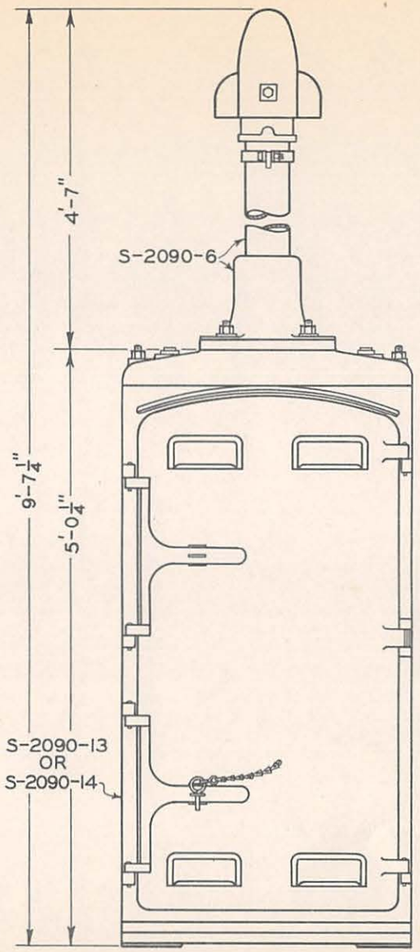
SHEET 3 OF 6

S-2090



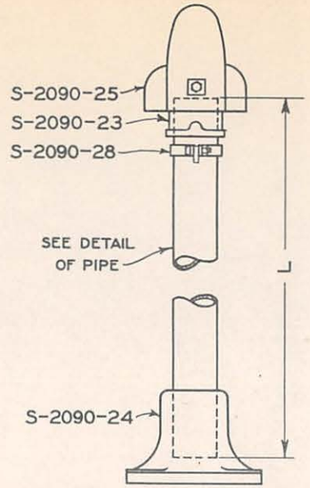
S-2090-1 INSTRUMENT CASE COMPLETE
AS SHOWN WITH LINING S-2090-31

S-2090-2 INSTRUMENT CASE COMPLETE
AS SHOWN WITHOUT LINING



S-2090-3 INSTRUMENT CASE COMPLETE
AS SHOWN WITH LINING S-2090-32

S-2090-4 INSTRUMENT CASE COMPLETE
AS SHOWN WITHOUT LINING



S-2090-5 CABLE POST COMPLETE
FOR USE ON INSTRUMENT CASE 3'-4 1/4" HIGH, L = 5'-3"

S-2090-6 CABLE POST COMPLETE
FOR USE ON INSTRUMENT CASE 5'-0 1/4" HIGH, L = 3'-7"

4 INCH PIPE SECTION
WROUGHT IRON OR STEEL

NOTE

INSTRUMENT CASES AND CABLE POST SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT FINISHING COAT OF BLACK ON EXTERIOR SURFACES SHALL BE OMITTED.

SCALE IN INCHES
0 3 6 9 12 15 18 21 24

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Brooke
VICE PRESIDENT

ERIE RAILROAD COMPANY
R Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Brooke
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
Bowman
VICE PRESIDENT

C. H.W.	C. D.M.	A. J.P.
K. L.M.		

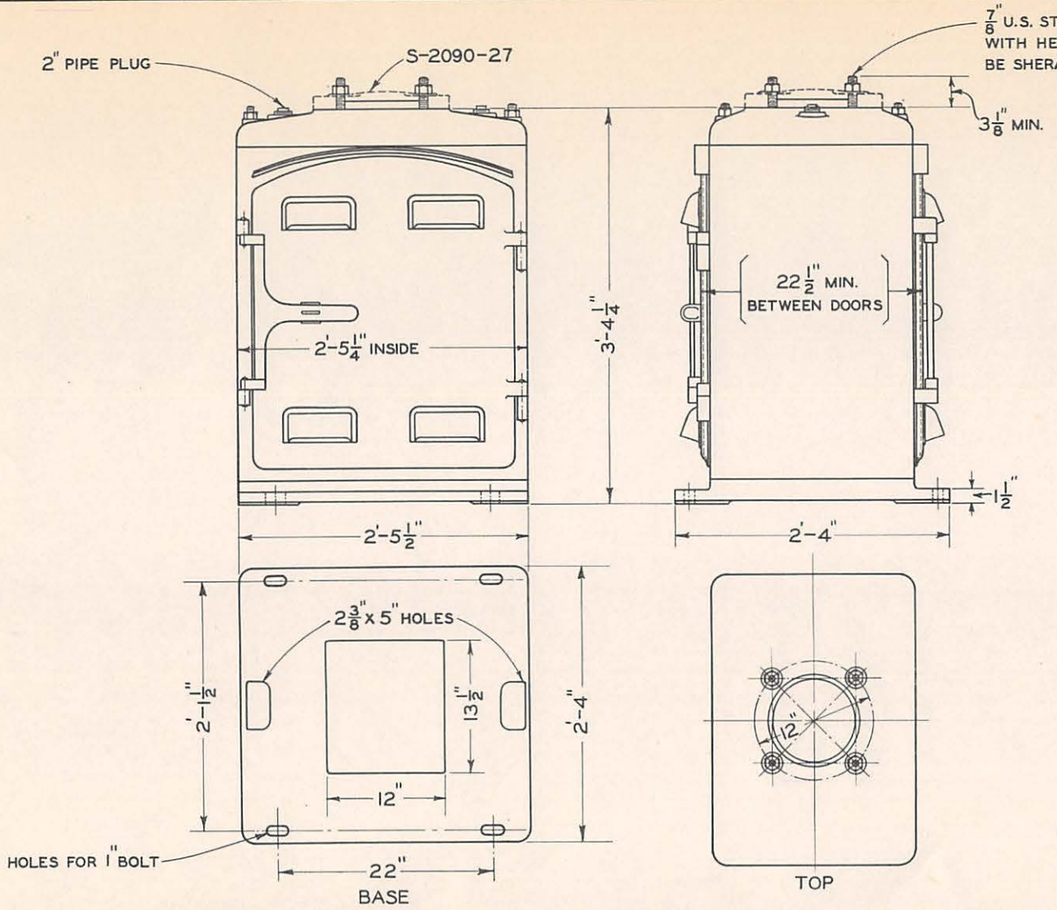
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

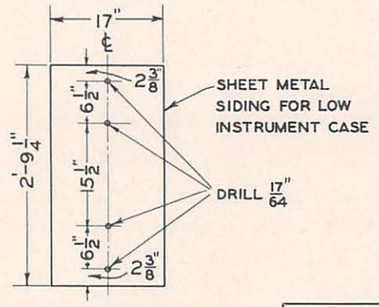
STANDARD
INSTRUMENT CASE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 27, 1933
CHIEF ENGINEER

SHEET 1 OF 6

S-2090





TEMPLATE FOR DRILLING OF CASE FOR LINING
NO SCALE

NOTE

INSTRUMENT CASE SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT FINISHING COAT OF BLACK ON EXTERIOR SURFACES SHALL BE OMITTED.

SCALE IN INCHES
0 3 6 9 12 15 18 21 24

S-2090-7	INSTRUMENT CASE		ONLY WITH SHIPPING COVER
S-2090-8	"	"	WITH LINING S-2090-31 AND SHIPPING COVER
S-2090-9	"	"	ONLY WITH COVER S-2090-27
S-2090-10	"	"	WITH LINING S-2090-31 AND COVER S-2090-27
S-2090-11	"	"	" " 2" CABLE OUTLET S-2090-22 WITH LINING S-2090-31 AND SHIPPING COVER
S-2090-12	"	"	ONLY WITH 2" CABLE OUTLET S-2090-22 AND SHIPPING COVER

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT

ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

C.H.W. K.L.M. | C.D.M. | A.J.P.

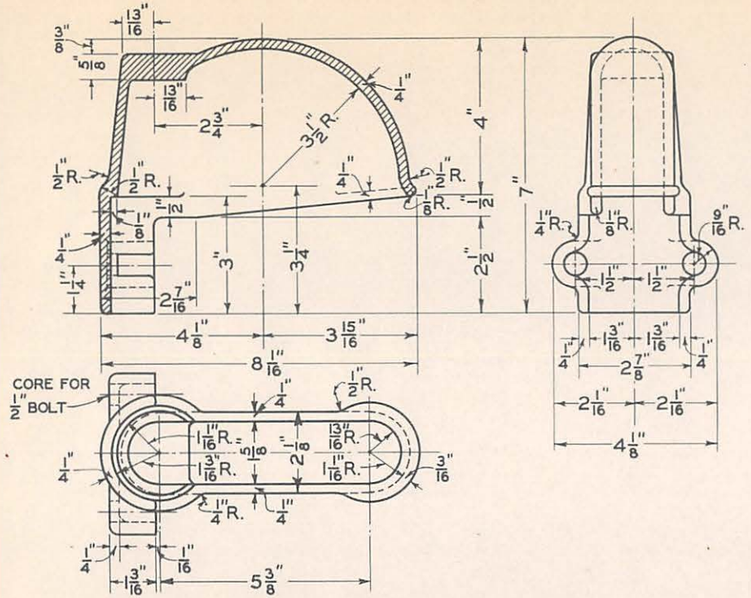
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD
INSTRUMENT CASE

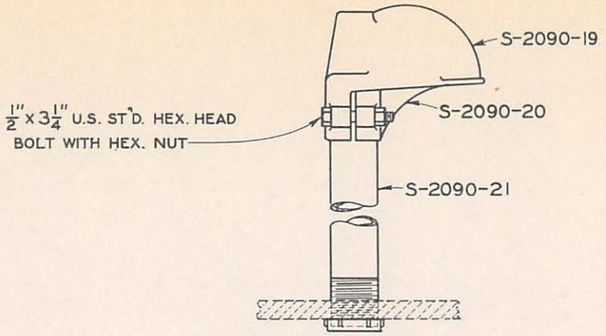
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 27, 1933
CHIEF ENGINEER

SHEET 2 OF 6

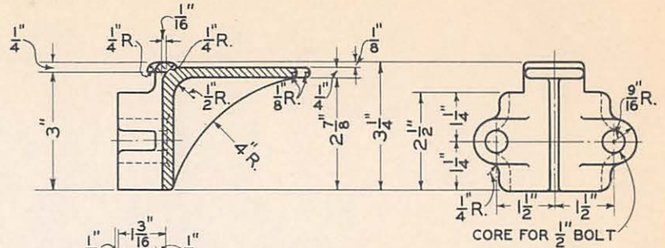
S-2090

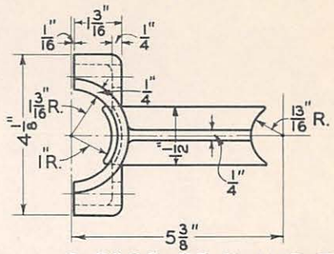


S-2090-19 CAP FOR 2 INCH PIPE ONLY
CAST IRON
SCALE (1)



S-2090-22 CABLE OUTLET COMPLETE
SCALE (2)





S-2090-20 CLAMP FOR 2 INCH PIPE ONLY
CAST IRON
SCALE (1)

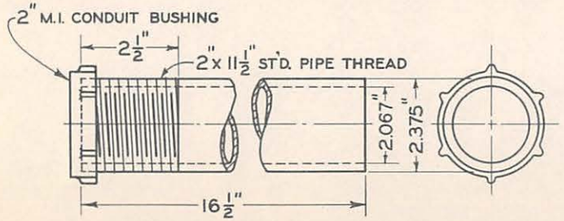
NOTE

ALL PARTS SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT FINISHING COAT OF BLACK ON EXTERIOR SURFACES SHALL BE OMITTED.

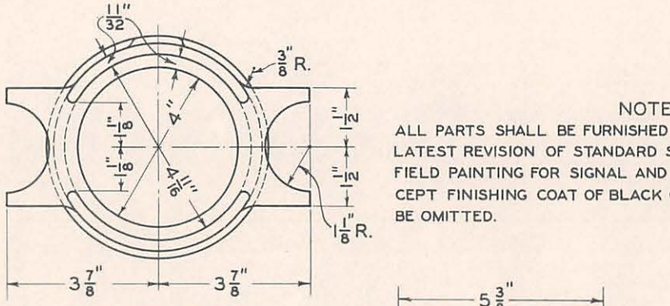
SCALE IN INCHES

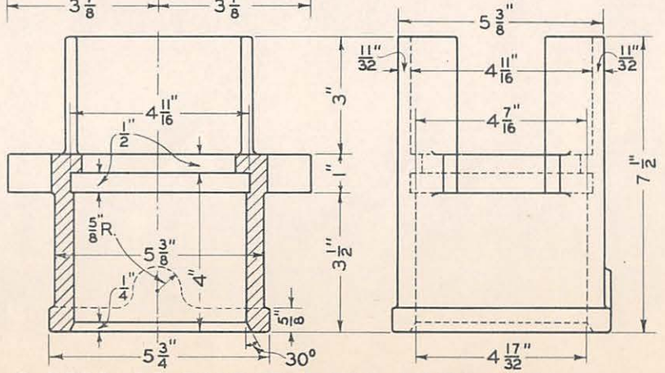
(1) 0 1 2 3 4 5 6

(2) 0 2 4 6 8 10 12



S-2090-21 2 INCH PIPE COMPLETE AS SHOWN
WROUGHT IRON OR STEEL, GALVANIZED
SCALE (1)





S-2090-23 POST HEAD FOR 4 INCH PIPE (PRESS FIT)
CAST IRON
SCALE (1)

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Woodcock, VICE PRESIDENT		
ERIE RAILROAD COMPANY — R Kell Woodruff, VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D Woodcock, VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — R H Bowman, VICE PRESIDENT		
C. H. W. K. L. M.	C. D. M.	A. J. P.

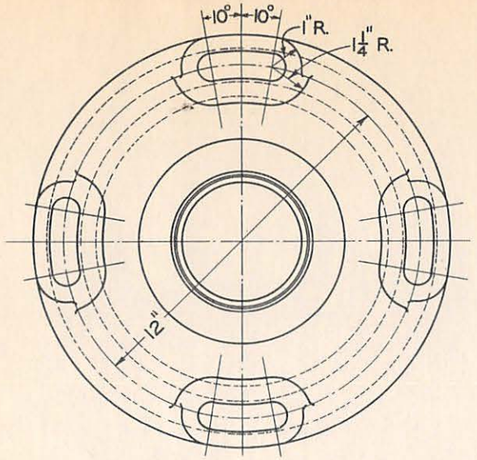
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

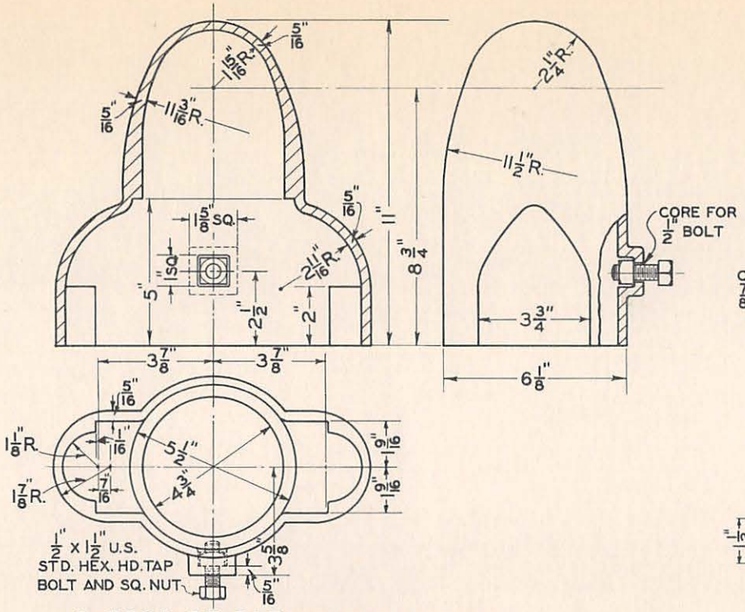
STANDARD
INSTRUMENT CASE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E Duncan CHIEF ENGINEER JUNE 27, 1933

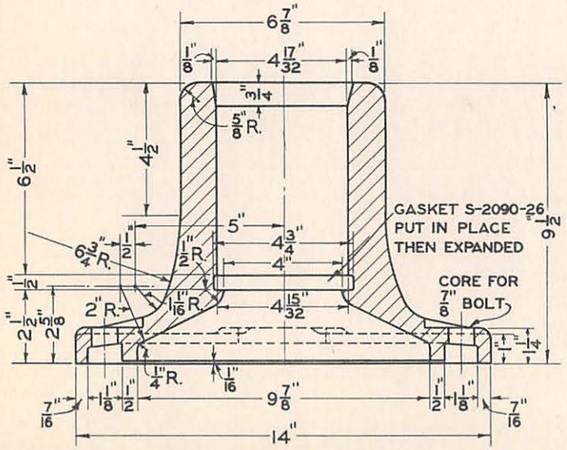
SHEET 4 OF 6

S-2090

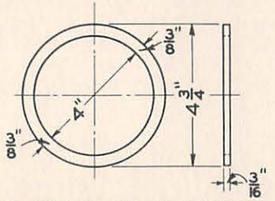




S-2090-25 CAP COMPLETE AS SHOWN
CAST IRON



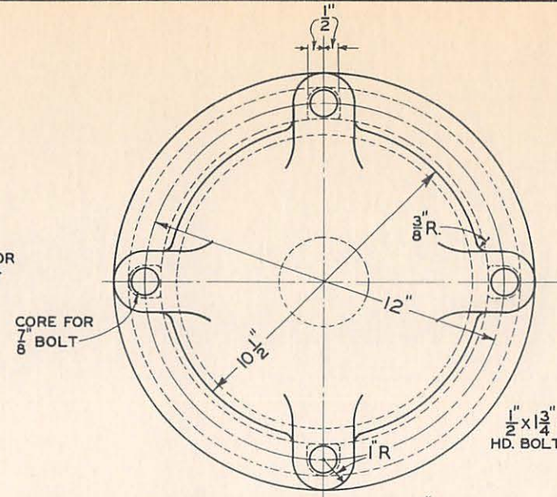
S-2090-24 SOCKET FOR 4 INCH PIPE WITH GASKET S-2090-26
CAST IRON

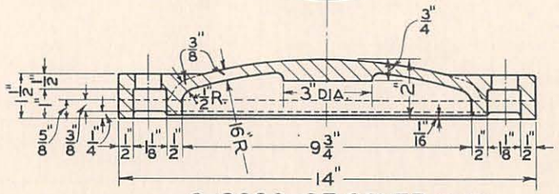


S-2090-26 GASKET
LEAD

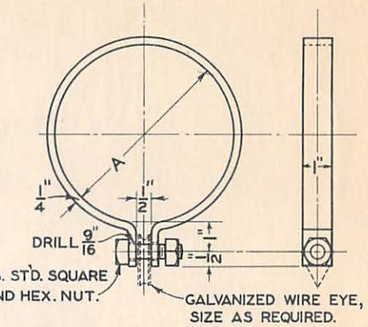
NOTE

ALL PARTS EXCEPT S-2090-26, GASKET, SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT FINISHING COAT OF BLACK ON EXTERIOR SURFACES SHALL BE OMITTED.





S-2090-27 COVER ONLY
CAST IRON



S-2090-28 CLAMP COMPLETE AS SHOWN, FOR 4 INCH PIPE A = 4 1/2"
S-2090-29 CLAMP COMPLETE AS SHOWN, FOR 5 INCH PIPE A = 5 9/16"
S-2090-30 CLAMP COMPLETE AS SHOWN, FOR 6 INCH PIPE A = 6 5/8"

SCALE IN INCHES
0 1 2 3 4 5 6 7 8

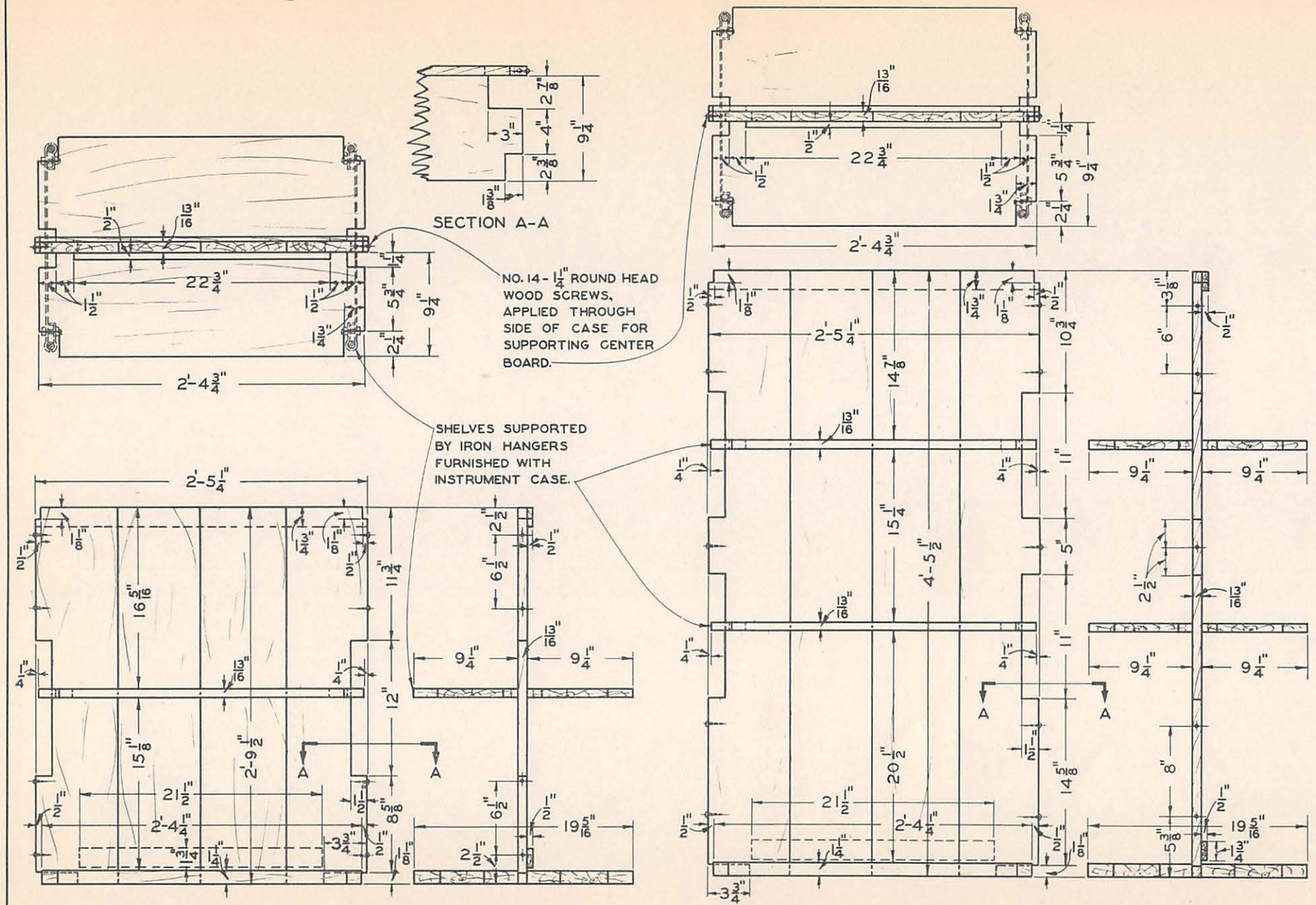
APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT	
ERIE RAILROAD COMPANY — VICE PRESIDENT	
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT	
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT	
C.H.W. K.L.M.	C.D.M. A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD INSTRUMENT CASE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 27, 1933
CHIEF ENGINEER

SHEET 5 OF 6
S-2090



S-2090-31 INSTRUMENT CASE LINING COMPLETE

S-2090-32 INSTRUMENT CASE LINING COMPLETE

NOTES

1. LINING SHALL BE MADE OF AIR SEASONED "INCH SHOP" WHITE PINE.
2. LINING SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES

0 3 6 9 12 15 18

APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY	D Booth, VICE PRESIDENT
ERIE RAILROAD COMPANY	R Ellwoodcuff, VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY	D Booth, VICE PRESIDENT
PERE MARQUETTE RAILWAY COMPANY	R Bowman, VICE PRESIDENT
C.H.W. C.H.W.	C.D.M. A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

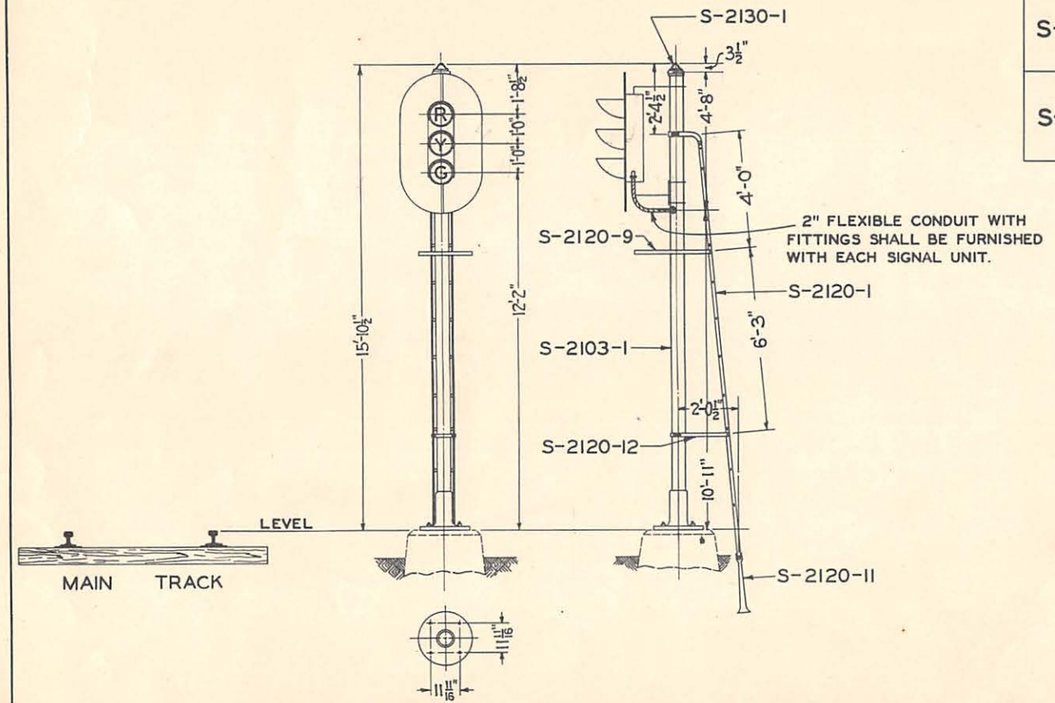
STANDARD
INSTRUMENT CASE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 27, 1933
CHIEF ENGINEER

SHEET 6 OF 6

S-2090

DRAWING NUMBER	DESCRIPTION	DRAWING NO. OF MAST ASSEMBLY
S-2100-1	ONE UNIT RYG COLOR LIGHT GROUND SIGNAL COMPLETE EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-1
S-2100-2	ONE UNIT RY COLOR LIGHT GROUND SIGNAL COMPLETE EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-2
S-2100-3	ONE UNIT RG COLOR LIGHT GROUND SIGNAL COMPLETE EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-2



S-2100-1 ONE UNIT THREE COLOR LIGHT GROUND SIGNAL

SCALE IN FEET
0 1 2 3 4 5 6 7 8

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

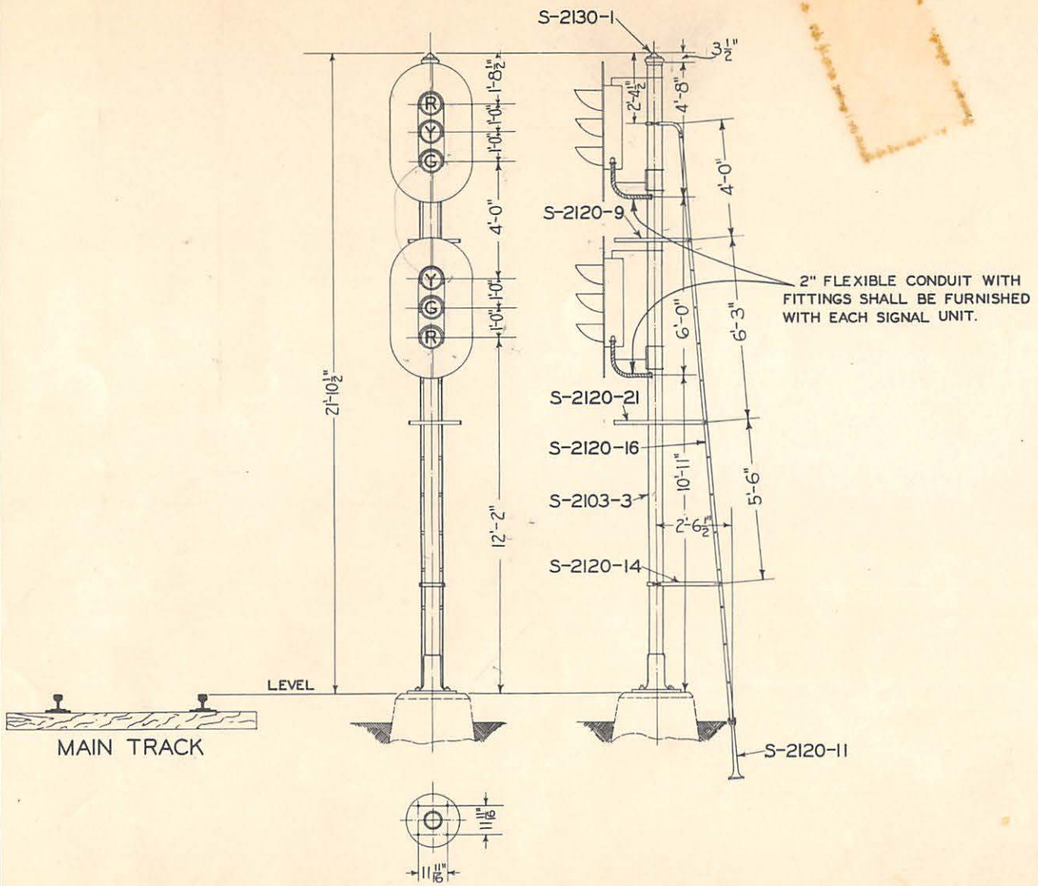
C.H.W. | C.B.P. | C.D.M. | A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD COLOR LIGHT GROUND SIGNAL, VERTICAL TYPE, ONE UNIT HEIGHT MAST

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: APRIL 21, 1931
CHIEF ENGINEER

S-2100



S-2101-1 TWO UNIT THREE COLOR LIGHT GROUND SIGNAL

SCALE IN FEET

0 1 2 3 4 5 6 7 8

DRAWING NUMBER	DESCRIPTION	DRAWING NO. OF MAST ASSEMBLY
S-2101-1	TWO UNIT RYG-YGR COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-3
S-2101-2	TWO UNIT RYG-GR COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-3
S-2101-3	TWO UNIT RYG-YR COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-3
S-2101-4	TWO UNIT RY-GR COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-4
S-2101-5	TWO UNIT RY-YR COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-4
S-2101-6	TWO UNIT RY-YGR COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-4
S-2101-7	TWO UNIT RG-YGR COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-4
S-2101-8	TWO UNIT RG-YR COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-4
S-2101-9*	TWO UNIT RYG-R COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-5
S-2101-10*	TWO UNIT R-YGR COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-6
S-2101-11*	TWO UNIT R-YR COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-6
S-2101-12*	TWO UNIT RG-R COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-7
S-2101-13*	TWO UNIT RY-R COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-7

* EACH SINGLE COLOR LIGHT UNIT SHALL BE FURNISHED WITH BACKGROUND FOR TWO-COLOR UNIT WITH EXTRA HOLE BLANKED.

344
345
346

Sim to B10325 sh. 373

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

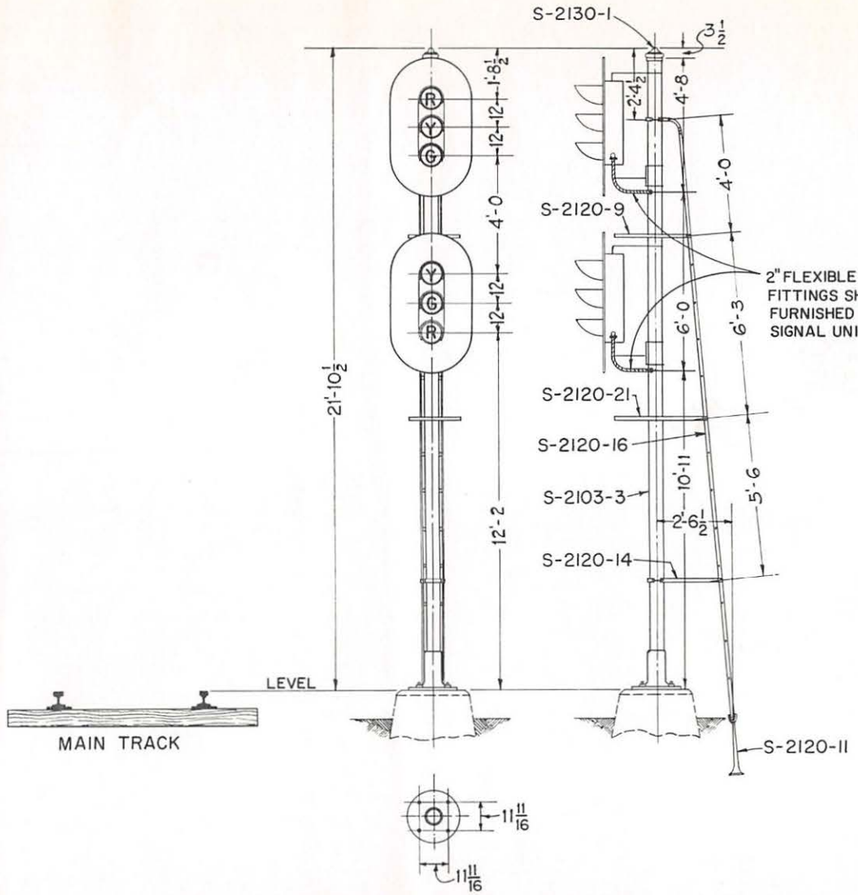
C.H.W. | C.S.L. | C.D.M. | A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD COLOR LIGHT GROUND SIGNAL, VERTICAL TYPE, TWO UNIT HEIGHT MAST

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: APRIL 21, 1931
CHIEF ENGINEER

S-2101



S-2101-1 TWO UNIT THREE COLOR LIGHT GROUND SIGNAL

SCALE IN FEET
0 1 2 3 4 5 6 7 8

DRAWING NUMBER	DESCRIPTION	DRAWING NO. OF MAST ASSEMBLY
S-2101-1	TWO UNIT RYG-YGR COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS	S-2103-3
S-2101-2	" " RYG-GR " " " " " " " " " " " "	S-2103-3
S-2101-3	" " RYG-YR " " " " " " " " " " " "	S-2103-3
S-2101-4	" " RY-GR " " " " " " " " " " " "	S-2103-4
S-2101-5	" " RY-YR " " " " " " " " " " " "	S-2103-4
S-2101-6	" " RY-YGR " " " " " " " " " " " "	S-2103-4
S-2101-7	" " RG-YGR " " " " " " " " " " " "	S-2103-4
S-2101-8	" " RG-YR " " " " " " " " " " " "	S-2103-4
S-2101-9	" " RYG-R " " " " " " " " " " UO " 126057 "	S-2103-5
S-2101-10	" " R-YGR " " " " " " " " " " UO " 134496 "	S-2103-6
S-2101-11	" " R-YR " " " " " " " " " " UO " 373644 "	S-2103-6
S-2101-12	" " RG-R " " " " " " " " " " UO " 159583 "	S-2103-7
S-2101-13	" " RY-R " " " " " " " " " " UO " 373663 "	S-2103-7
S-2101-14	" " RYG-YG " " " " " " " " " " UO " 346254 "	S-2103-3
S-2101-15	" " RYG-G " " " " " " " " " " UO " 271433 "	S-2103-5
S-2101-16	" " RYG-Y " " " " " " " " " " UO " 346253 "	S-2103-5
S-2101-17	" " RY-YG " " " " " " " " " " UO " 346256 "	S-2103-4
S-2101-18	" " RY-G " " " " " " " " " " UO " 271434 "	S-2103-7
S-2101-19	" " RY-Y " " " " " " " " " " UO " 346255 "	S-2103-7

REVISIONS
(A) JULY 7, 1958.

D.H.	U.H.A.	E.A.B.
D.H.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
OFFICE SUPERINTENDENT OF SIGNALS — RICHMOND, VIRGINIA.

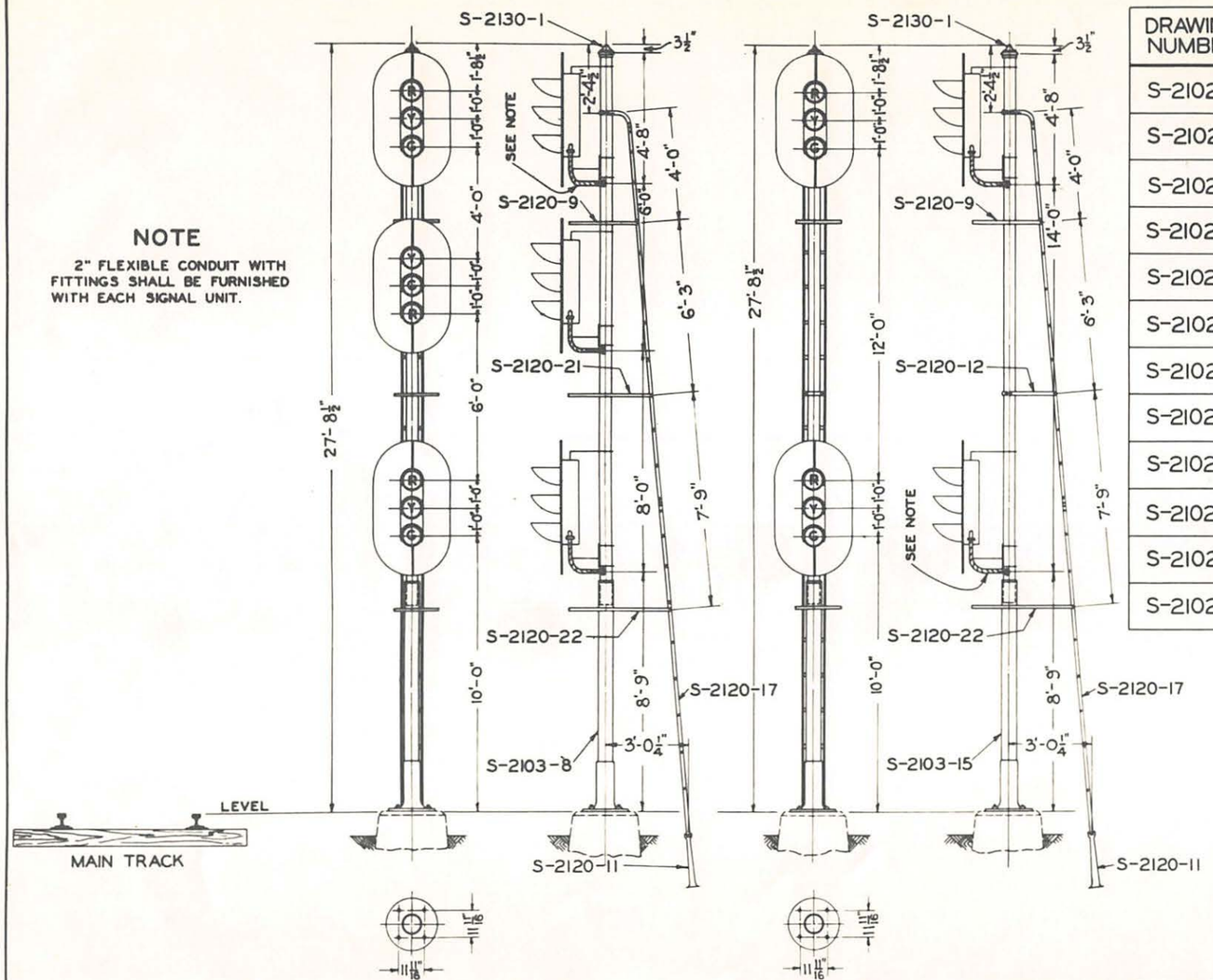
STANDARD COLOR LIGHT GROUND SIGNAL, VERTICAL TYPE, TWO UNIT HEIGHT MAST

APPROVED T. H. Carlson
SUPERINTENDENT OF SIGNALS
JULY 7, 1958.

SHEET 1
S-2101A

NOTE

2" FLEXIBLE CONDUIT WITH FITTINGS SHALL BE FURNISHED WITH EACH SIGNAL UNIT.



S-2102-1 THREE UNIT THREE COLOR LIGHT GROUND SIGNAL

S-2102-9 TWO UNIT THREE COLOR LIGHT THREE UNIT HEIGHT GROUND SIGNAL

DRAWING NUMBER	DESCRIPTION	DRAWING NO. OF MAST ASSEMBLY
S-2102-1	THREE UNIT RYG-YGR-RYG COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-8
S-2102-2	THREE UNIT RYG-YGR-RY COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-9
S-2102-3	THREE UNIT RYG-YR-RY COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-9
S-2102-4	THREE UNIT RG-YGR-RY COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-10
S-2102-5*	THREE UNIT R-YGR-R COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-11
S-2102-6*	THREE UNIT R-YGR-RY COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-12
S-2102-7*	THREE UNIT RY-YGR-R COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-13
S-2102-8	TWO UNIT-THREE UNIT HEIGHT RY-RYG COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-14
S-2102-9	TWO UNIT-THREE UNIT HEIGHT RYG-RYG COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-15
S-2102-10*	TWO UNIT-THREE UNIT HEIGHT R-RYG COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-16
S-2102-11	TWO UNIT-THREE UNIT HEIGHT RYG-RY COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-17
S-2102-12*	TWO UNIT-THREE UNIT HEIGHT RYG-R COLOR LIGHT GROUND SIGNAL COMPLETE, EXCEPT WITHOUT LAMPS AND FOUNDATION BOLTS.	S-2103-18

* EACH SINGLE COLOR LIGHT UNIT SHALL BE FURNISHED WITH BACKGROUND FOR TWO-COLOR UNIT WITH EXTRA HOLE BLANKED.

SCALE IN FEET
0 1 2 3 4 5 6 7 8

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D. Brooks VICE PRESIDENT

ERIE RAILROAD COMPANY
H. E. Woodruff VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
J. H. Deem VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A. J. Bowman VICE PRESIDENT

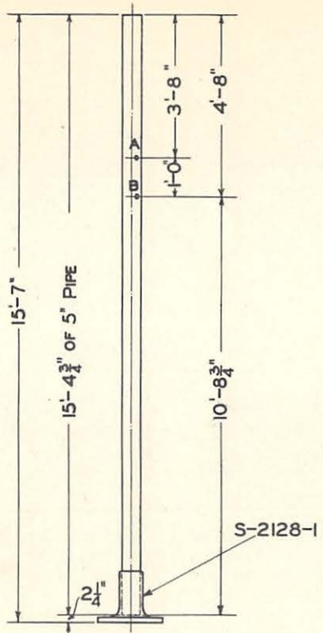
C.H.W. | C.D.M. | A.J.P.
C.B.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD COLOR LIGHT GROUND SIGNAL, VERTICAL TYPE, THREE UNIT HEIGHT MAST

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: A. M. Nichol CHIEF ENGINEER APRIL 21, 1931

S-2102

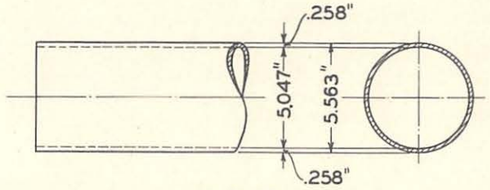


SCALE ①

ONE UNIT MAST

DRILLING OF MAST

UNIT ARRANGEMENT	(R) (Y) (G)	(R) (Y) (R) (G)
FIGURE	1	2 3
DESCRIPTION OF DRILLING	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "B"	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "A"
MAST	S-2103-1	S-2103-2



SCALE ②

5" PIPE SECTION

WROUGHT IRON OR STEEL

NOTES

HOLE FOR CONDUIT OUTLET SHALL BE DRILLED 45° TO THE RIGHT OF FRONT CENTER LINE OF MAST.

MASTS SHALL HAVE PURCHASER'S DRAWING NUMBER PAINTED ON BOTTOM OF BASE BEFORE SHIPMENT.

MASTS SHALL BE FURNISHED PAINTED INSIDE AND OUT WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES

① 0 12 24 36 48 60 72

② 0 1 2 3 4 5 6 7 8 9 10 11 12

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Brooks
VICE PRESIDENT

ERIE RAILROAD COMPANY
H.A. Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

C.H.W. C.S.L. | C.D.M. | A.J.P.

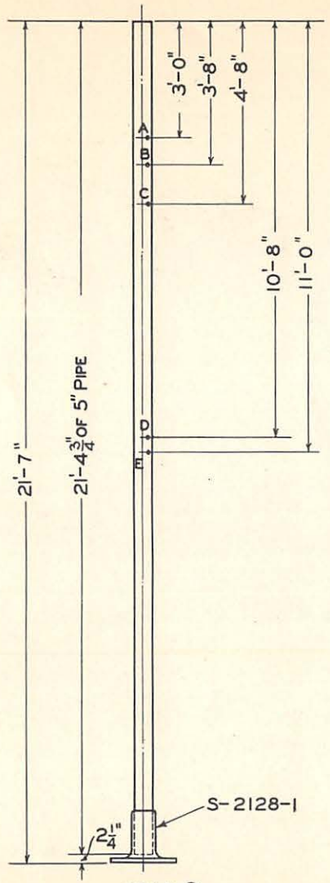
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD MASTS FOR VERTICAL TYPE COLOR LIGHT GROUND SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: APRIL 21, 1931
CHIEF ENGINEER

SHEET 1 OF 3

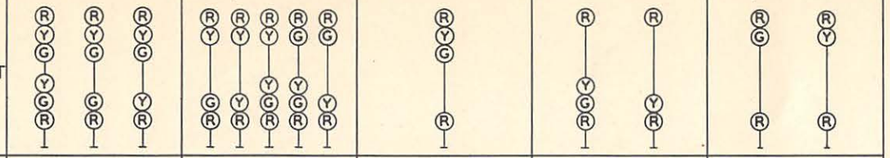
S-2103



SCALE ①

TWO UNIT MAST

DRILLING OF MAST

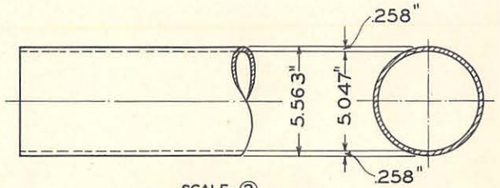
UNIT ARRANGEMENT												
FIGURE	1	2	3	4	5	6	7	8	9	10	11	12	13
DESCRIPTION OF DRILLING	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "C" AND "D".			MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "B" AND "D".					MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "C" AND "E".	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "A" AND "D".		MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "B" AND "E".	
MAST	S-2103-3			S-2103-4					S-2103-5	S-2103-6		S-2103-7	

NOTES

HOLES FOR CONDUIT OUTLET SHALL BE DRILLED 45° TO THE RIGHT OF FRONT CENTER LINE OF MAST.

MASTS SHALL HAVE PURCHASER'S DRAWING NUMBER PAINTED ON BOTTOM OF BASE BEFORE SHIPMENT.

MASTS SHALL BE FURNISHED PAINTED INSIDE AND OUT WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



SCALE ②

5" PIPE SECTION

WROUGHT IRON OR STEEL

SCALE IN INCHES

① 0 12 24 36 48 60 72

② 0 1 2 3 4 5 6 7 8 9 10 11 12

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT

ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

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C.H.W.	C.D.M.	A.J.P.
C.S.L.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

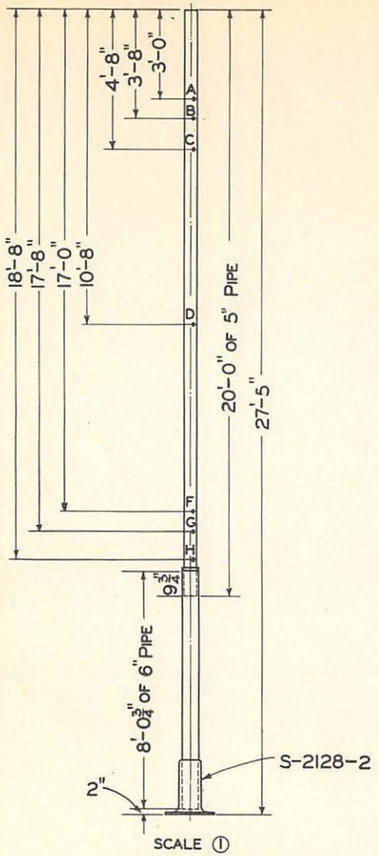
STANDARD MASTS FOR VERTICAL TYPE COLOR LIGHT GROUND SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: APRIL 21, 1931
CHIEF ENGINEER

SHEET 2 OF 3

S-2103



SCALE ①

THREE UNIT MAST

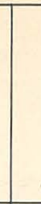
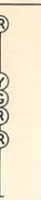
NOTES

45° HOLES FOR CONDUIT OUTLET SHALL BE DRILLED TO THE RIGHT OF FRONT CENTER LINE OF MAST.

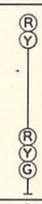
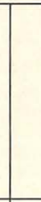
MASTS SHALL HAVE PURCHASER'S DRAWING NUMBER PAINTED ON BOTTOM OF BASE BEFORE SHIPMENT.

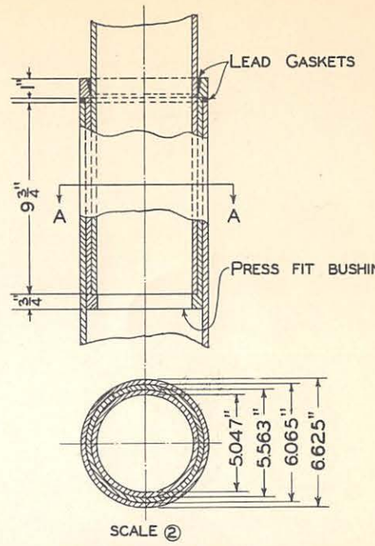
MASTS SHALL BE FURNISHED PAINTED INSIDE AND OUT WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

DRILLING OF MAST

UNIT ARRANGEMENT							
FIGURE	1	2	3	4	5	6	7
DESCRIPTION OF DRILLING	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "C," "D" AND "H."	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "C," "D" AND "G."		MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "B," "D" AND "G."	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "A," "D" AND "F."	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "A","D" AND "G."	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "B", "D" AND "F."
MAST	S-2103-8	S-2103-9		S-2103-10	S-2103-11	S-2103-12	S-2103-13

DRILLING OF MAST

UNIT ARRANGEMENT					
FIGURE	8	9	10	11	12
DESCRIPTION OF DRILLING	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "B" AND "H."	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "C" AND "H."	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "A" AND "H."	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "C" AND "G."	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "C" AND "F."
MAST	S-2103-14	S-2103-15	S-2103-16	S-2103-17	S-2103-18



SCALE ②

SECTION A-A

JOINT BETWEEN 5" AND 6" PIPE

WROUGHT IRON OR STEEL

SCALE IN FEET

① 0 1 2 3 4 5 6 7 8

SCALE IN INCHES

② 0 1 2 3 4 5 6 7 8 9 10 11 12

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT

ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

CHW.	C.D.M.	A.J.P.
C.S.L.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
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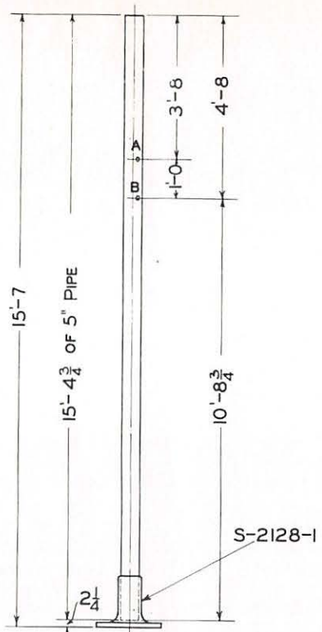
STANDARD MASTS FOR VERTICAL TYPE COLOR LIGHT GROUND SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: CHIEF ENGINEER — APRIL 21, 1931

SHEET 3 OF 3

S-2103

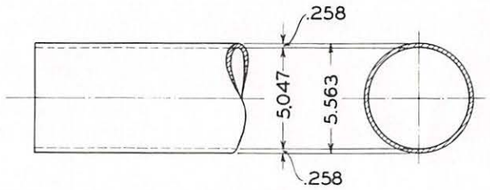


SCALE ①

ONE UNIT MAST

DRILLING OF MAST

UNIT ARRANGEMENT	(R) (Y) (G)	(R) (Y)	(R) (G)
FIGURE	1	2	3
DESCRIPTION OF DRILLING	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "B"	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "A"	
MAST	S-2103-1	S-2103-2	



SCALE ②

5" PIPE SECTION

WROUGHT IRON OR STEEL

NOTES

HOLE FOR CONDUIT OUTLET SHALL BE DRILLED 45° TO THE RIGHT OF FRONT CENTER LINE OF MAST.

MASTS SHALL HAVE PURCHASER'S DRAWING NUMBER PAINTED ON BOTTOM OF BASE BEFORE SHIPMENT.

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SCALE IN INCHES

① 0 12 24 36 48 60 72

② 0 1 2 3 4 5 6 7 8 9 10 11 12

REVISIONS

(A) JULY 7, 1958.

D.H	U.H.A.	E.A.B.
D.H.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY

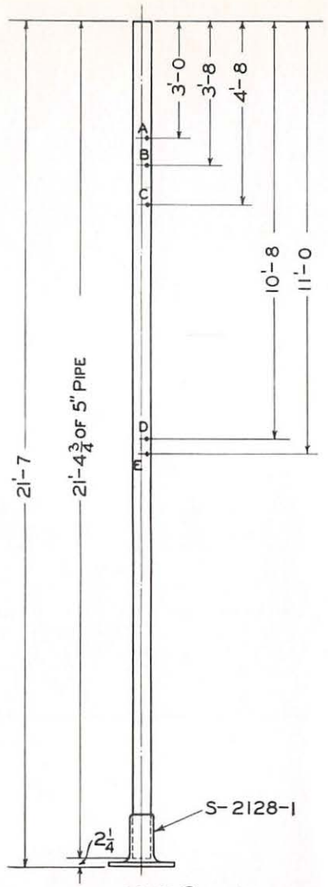
OFFICE SUPERINTENDENT OF SIGNALS — RICHMOND, VIRGINIA.

STANDARD MASTS FOR VERTICAL TYPE COLOR LIGHT GROUND SIGNALS

APPROVED J. H. Carlson

SUPERINTENDENT OF SIGNALS

JULY 7, 1958.



SCALE ①
TWO UNIT MAST

DRILLING OF MAST

UNIT ARRANGEMENT	R Y G Y G R	R Y G G R	R Y G Y R	R Y G Y G	R Y Y G R	R Y Y Y G R	R Y Y Y G R	R Y Y G G R	R Y Y G G R	R Y Y G G R	R Y G G R	R Y G G Y	R Y G Y G	R Y G Y G	R	R	Y C R	Y R	R G R	R Y R	R Y Y	R Y G
FIGURE	1	2	3	4	5	6	7	8	9	10	11	12	13		14	15			16	17	18	19
DESCRIPTION OF DRILLING	MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "C" AND "D".				MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "B" AND "D".						MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "C" AND "E".				MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "A" AND "D".				MAST TO BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR AS SHOWN AT "B" AND "E".			
MAST	S-2103-3				S-2103-4						S-2103-5				S-2103-6				S-2103-7			

NOTES

HOLES FOR CONDUIT OUTLET SHALL BE DRILLED 45° TO THE RIGHT OF FRONT CENTER LINE OF MAST.

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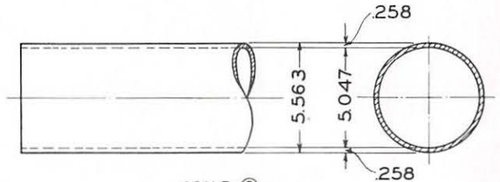


SCALE ②
5" PIPE SECTION
WROUGHT IRON OR STEEL

SCALE IN INCHES
① 0 12 24 36 48 60 72
② 0 1 2 3 4 5 6 7 8 9 10 11 12

REVISIONS

(A) JULY 7, 1958.

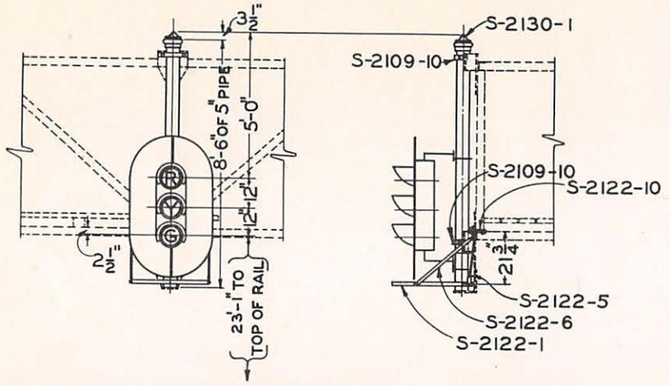
D.H.	U.H.A.	E.A.B.
D.H.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY

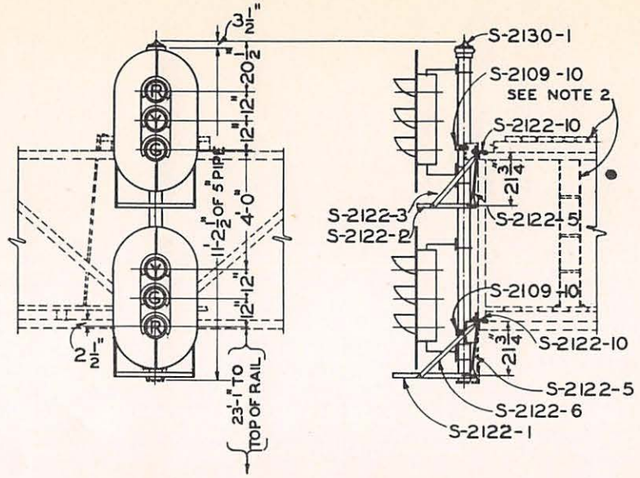
OFFICE SUPERINTENDENT OF SIGNALS- RICHMOND, VIRGINIA.

STANDARD MASTS FOR VERTICAL TYPE COLOR LIGHT GROUND SIGNALS

APPROVED. H. Carlson
SUPERINTENDENT OF SIGNALS
JULY 7, 1958.



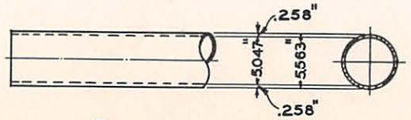
S-2104-1 ONE UNIT THREE COLOR LIGHT BRIDGE SIGNAL
SCALE ②



S-2104-4 TWO UNIT THREE COLOR LIGHT BRIDGE SIGNAL
SCALE ②

DRAWING NUMBER	DESCRIPTION
S-2104-1	ONE UNIT RYG COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS
S-2104-2	" " RY " " " " " " " " "
S-2104-3	" " RG " " " " " " " " "
S-2104-4	TWO UNIT RYG-YGR COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS
S-2104-5	" " RYG-GR " " " " " " " " "
S-2104-6	" " RYG-YR " " " " " " " " "
S-2104-7	" " RY-GR " " " " " " " " "
S-2104-8	" " RY-YR " " " " " " " " "
S-2104-9	" " RY-YGR " " " " " " " " "
S-2104-10	" " RG-YGR " " " " " " " " "
S-2104-11	" " RG-YR " " " " " " " " "
S-2104-12*	" " RYG-R " " " " " " " " "
S-2104-13*	" " R-YGR " " " " " " " " "
S-2104-14*	" " R-YR " " " " " " " " "
S-2104-15*	" " RG-R " " " " " " " " "
S-2104-16*	" " RY-R " " " " " " " " "

* EACH SINGLE COLOR LIGHT UNIT SHALL BE FURNISHED WITH BACKGROUND FOR TWO-COLOR UNIT WITH EXTRA HOLE BLANKED.



5" PIPE SECTION
WROUGHT IRON OR STEEL
SCALE ①

NOTES

1. SIGNALS MAY BE ASSEMBLED WITH UNITS ON EITHER SIDE OR CENTER OF MAST, AS REQUIRED.
2. LADDER IS NOT INCLUDED IN SIGNAL ASSEMBLY. FOR DETAILS OF HANDRAIL, LADDER, AND PLATFORM ARRANGEMENT SEE STANDARD DRAWING S-2123.
3. SIGNAL ASSEMBLIES ARE FOR APPLICATION TO STANDARD TWO, THREE, AND FOUR TRACK SIGNAL BRIDGE, S-2995.
4. MASTS SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT FINISHING COAT OF BLACK ON EXTERIOR SURFACES SHALL BE OMITTED.
5. EACH SINGLE LIGHT UNIT SHALL BE FURNISHED WITH ONE ¾" BUSHING AND ALL OTHER UNITS SHALL BE FURNISHED WITH ONE 2" BUSHING IN WIRE OUTLET.

SCALE IN FEET
① 0 1 2
② 0 1 2 3 4 5 6 7 8

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
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VICE PRESIDENT

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PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
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THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
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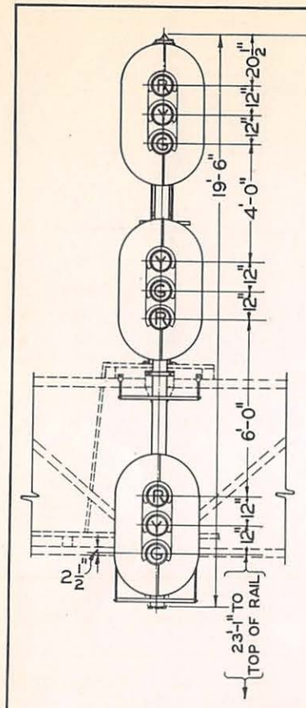
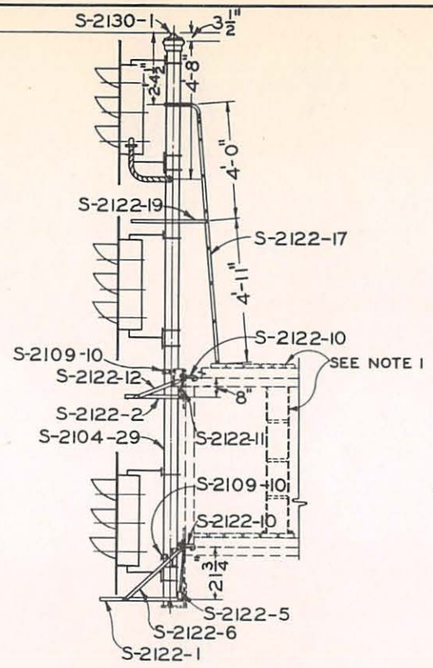
PERE MARQUETTE RAILWAY COMPANY

STANDARD COLOR LIGHT BRIDGE SIGNAL, VERTICAL TYPE

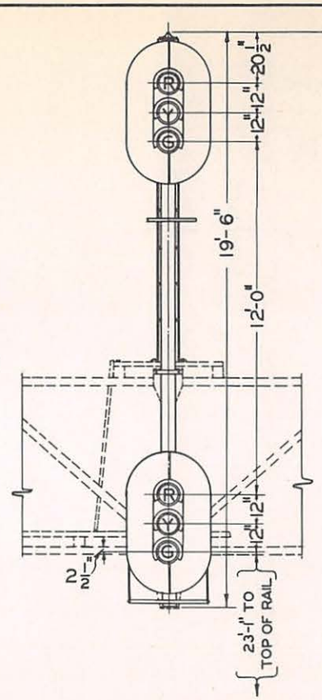
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. Wallace
CHAIRMAN
DEC. 7, 1942

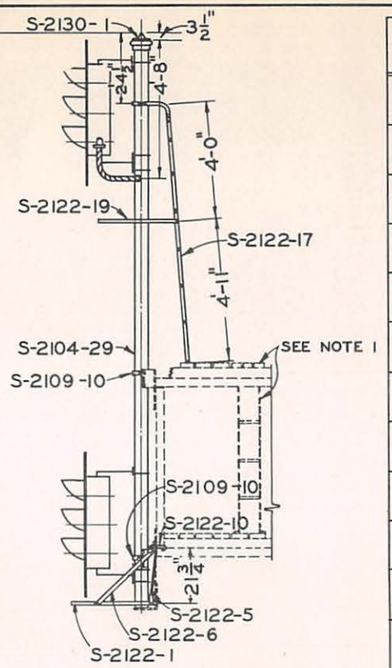




S-2104-17 THREE UNIT THREE COLOR LIGHT BRIDGE SIGNAL

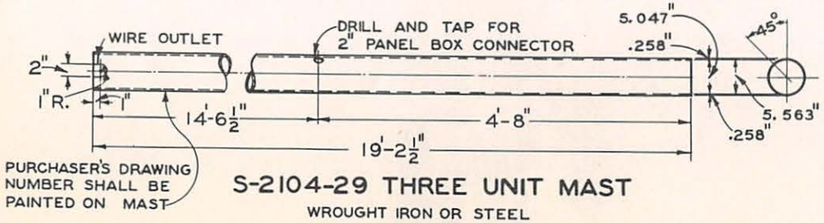
SCALE ②





S-2104-25 TWO UNIT THREE COLOR LIGHT THREE UNIT HEIGHT BRIDGE SIGNAL

SCALE ②



S-2104-29 THREE UNIT MAST

WROUGHT IRON OR STEEL

SCALE ①

NOTES

1. LADDER IS NOT INCLUDED IN SIGNAL ASSEMBLY. FOR DETAILS OF HANDRAIL, LADDER, AND PLATFORM ARRANGEMENT SEE STANDARD DWG. S-2123.
2. SIGNAL ASSEMBLIES ARE FOR APPLICATION TO STANDARD TWO, THREE, AND FOUR TRACK SIGNAL BRIDGE, S-2995.
3. MASTS SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT FINISHING COAT OF BLACK ON EXTERIOR SURFACES SHALL BE OMITTED.
4. EACH SINGLE LIGHT TOP UNIT SHALL BE FURNISHED WITH ONE ¾" I. D. DOUBLE STRIP GALV. FLEXIBLE CONDUIT, FITTINGS AND 2" X ¾" REDUCING BUSHING. ALL OTHER SINGLE LIGHT UNITS SHALL BE FURNISHED WITH ONE ¾" BUSHING IN WIRE OUTLET.
5. EACH TWO OR THREE COLOR LIGHT TOP UNIT SHALL BE FURNISHED WITH ONE 2" I. D. DOUBLE STRIP GALV. FLEXIBLE CONDUIT AND FITTINGS. ALL OTHER TWO OR THREE COLOR LIGHT UNITS SHALL BE FURNISHED WITH ONE 2" BUSHING IN WIRE OUTLET.

DRAWING NUMBER	DESCRIPTION
S-2104-17	THREE UNIT RYG-YGR-RYG COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.
S-2104-18	THREE UNIT RYG-YGR-RY COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.
S-2104-19	THREE UNIT RYG-YR-RY COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.
S-2104-20	THREE UNIT RG-YGR-RY COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.
S-2104-21 *	THREE UNIT R-YGR-R COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.
S-2104-22 *	THREE UNIT R-YGR-RY COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.
S-2104-23 *	THREE UNIT RY-YGR-R COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.
S-2104-24	TWO UNIT-THREE UNIT HEIGHT RY-RYG COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.
S-2104-25	TWO UNIT - THREE UNIT HEIGHT RYG-RYG COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.
S-2104-26 *	TWO UNIT - THREE UNIT HEIGHT R-RYG COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.
S-2104-27	TWO UNIT - THREE UNIT HEIGHT RYG-RY COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.
S-2104-28 *	TWO UNIT - THREE UNIT HEIGHT RYG-R COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS.

* EACH SINGLE COLOR LIGHT UNIT SHALL BE FURNISHED WITH BACKGROUND FOR TWO-COLOR UNIT WITH EXTRA HOLE BLANKED.

SCALE IN FEET

① 0 1 2 3

② 0 2 3 4 5 6 7 8

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H.A. Commaster
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
H.W. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
J.M. Davis
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A.H. Bowman
PRESIDENT

C.H.W. C.H.W. W.S.E. W.N.H.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
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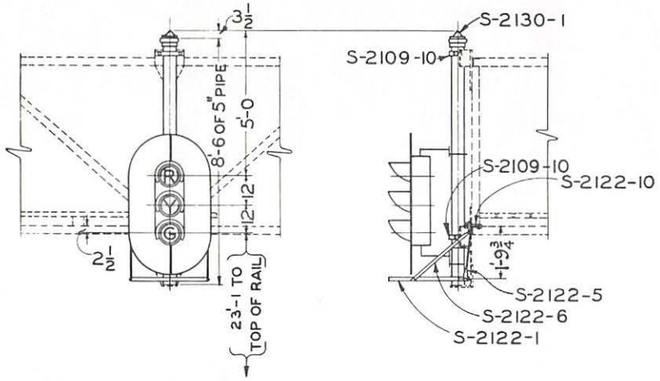
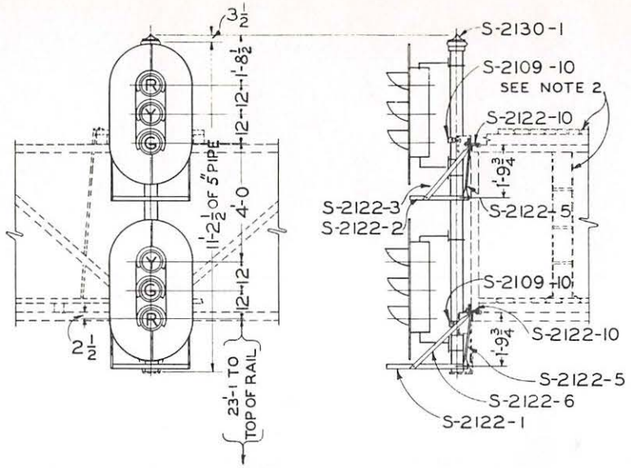
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD COLOR LIGHT BRIDGE SIGNAL, VERTICAL TYPE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. E. Wallace
CHAIRMAN
DEC. 7, 1942



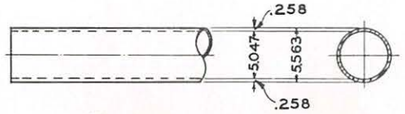
S-2104-1 ONE UNIT THREE COLOR LIGHT BRIDGE SIGNAL
SCALE ②



S-2104-4 TWO UNIT THREE COLOR LIGHT BRIDGE SIGNAL
SCALE ②

DRAWING NUMBER	DESCRIPTION
S-2104-1	ONE UNIT RYG COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS
S-2104-2	" " RY " " " " " " " "
S-2104-3	" " RG " " " " " " " "
S-2104-4	TWO UNIT RYG-YGR COLOR LIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS
S-2104-5	" " RYG-GR " " " " " " " "
S-2104-6	" " RYG-YR " " " " " " " "
S-2104-7	" " RY-GR " " " " " " " "
S-2104-8	" " RY-YR " " " " " " " "
S-2104-9	" " RY-YGR " " " " " " " "
S-2104-10	" " RG-YGR " " " " " " " "
S-2104-11	" " RG-YR " " " " " " " "
S-2104-12	" " RYG-R " " " " " UO 373659 " "
S-2104-13	" " R-YGR " " " " " UO "373661 " "
S-2104-14	" " R-YR " " " " " UO "373662 " "
S-2104-15	" " RG-R " " " " " UO "390856 " "
S-2104-16	" " RY-R " " " " " UO "373660 " "
S-2104-17	" " RYG-YG " " " " " UO "346258 " "
S-2104-18	" " RYG-G " " " " " UO "271436 " "
S-2104-19	" " RYG-Y " " " " " UO "346257 " "
S-2104-20	" " RY-YG " " " " " UO "271435" "346252"
S-2104-21	" " RY-G " " " " " UO "346251" "271435"
S-2104-22	" " RY-Y " " " " " UO "346251 " "

SCALE IN FEET
① 0 1 2
② 0 1 2 3 4 5 6 7 8



5" PIPE SECTION
WROUGHT IRON OR STEEL
SCALE ①

NOTES

1. SIGNALS MAY BE ASSEMBLED WITH UNITS ON EITHER SIDE OR CENTER OF MAST, AS REQUIRED.
2. LADDER IS NOT INCLUDED IN SIGNAL ASSEMBLY. FOR DETAILS OF HANDRAIL, LADDER, AND PLATFORM ARRANGEMENT SEE STANDARD DRAWING S-2123.
3. SIGNAL ASSEMBLIES ARE FOR APPLICATION TO STANDARD TWO, THREE, AND FOUR TRACK SIGNAL BRIDGE, S-2995 OR C.E. 16887.
4. MASTS SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT FINISHING COAT OF BLACK ON EXTERIOR SURFACES SHALL BE OMITTED.
5. EACH SINGLE LIGHT UNIT SHALL BE FURNISHED WITH ONE ¾" BUSHING AND ALL OTHER UNITS SHALL BE FURNISHED WITH ONE 2" BUSHING IN WIRE OUTLET.

REVISIONS
(B) JULY 7, 1958.

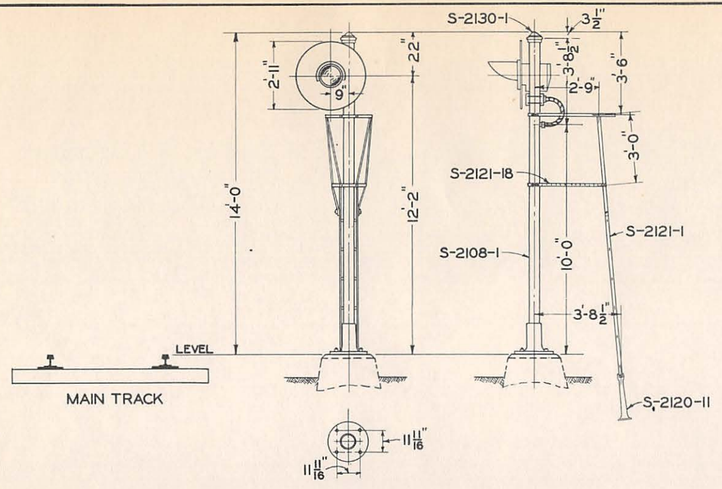
D.H.	U.H.A.	E.A.B.
D.H.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
OFFICE SUPERINTENDENT OF SIGNALS — RICHMOND, VIRGINIA.

STANDARD COLOR LIGHT BRIDGE SIGNAL, VERTICAL TYPE, ONE AND TWO UNIT HEIGHT MASTS

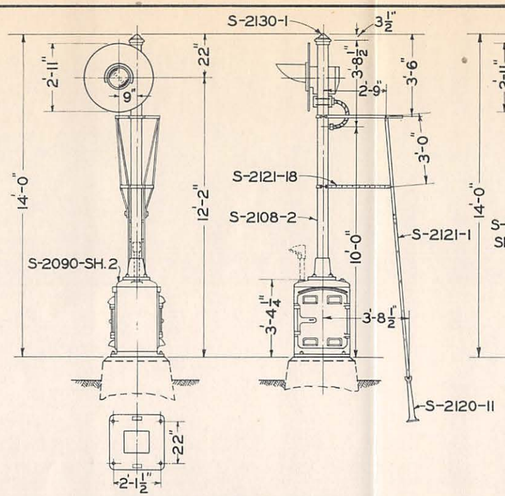
APPROVED... H. H. Jackson
SUPERINTENDENT OF SIGNALS
JULY 7, 1958.

RECEIVED
SEP 8 1958
CRD. ENTRY SECT.



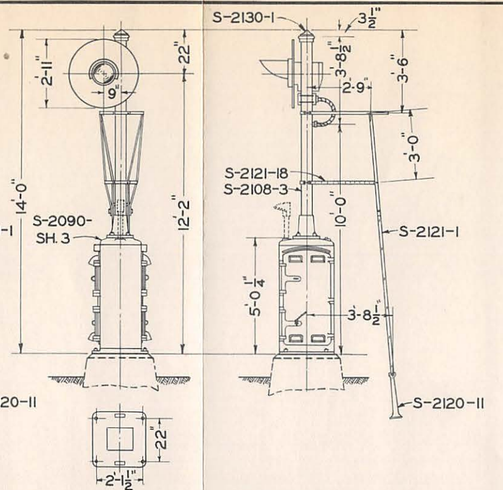
ONE UNIT COLOR LIGHT
SEARCHLIGHT GROUND SIGNAL

DRAWING NUMBER	DESCRIPTION
S-2105-1	ONE UNIT SEARCHLIGHT GROUND SIGNAL FOR MOUNTING ON CONCRETE FOUNDATION COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMP



ONE UNIT COLOR LIGHT
SEARCHLIGHT GROUND SIGNAL

DRAWING NUMBER	DESCRIPTION
S-2105-2	ONE UNIT SEARCHLIGHT GROUND SIGNAL WITH INSTRUMENT CASE 3'-4¼" HIGH COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMP. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING S-2090-31 OR 2" CABLE OUTLET S-2090-22



ONE UNIT COLOR LIGHT
SEARCHLIGHT GROUND SIGNAL

DRAWING NUMBER	DESCRIPTION
S-2105-3	ONE UNIT SEARCHLIGHT GROUND SIGNAL WITH INSTRUMENT CASE 5'-0¼" HIGH COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMP. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING S-2090-32 OR 2" CABLE OUTLET S-2090-22

NOTE

EACH SIGNAL UNIT SHALL BE FURNISHED WITH ONE 2" I.D. DOUBLE STRIP GALVANIZED FLEXIBLE CONDUIT AND FITTINGS.

SCALE IN FEET
0 1 2 3 4 5 6 7 8

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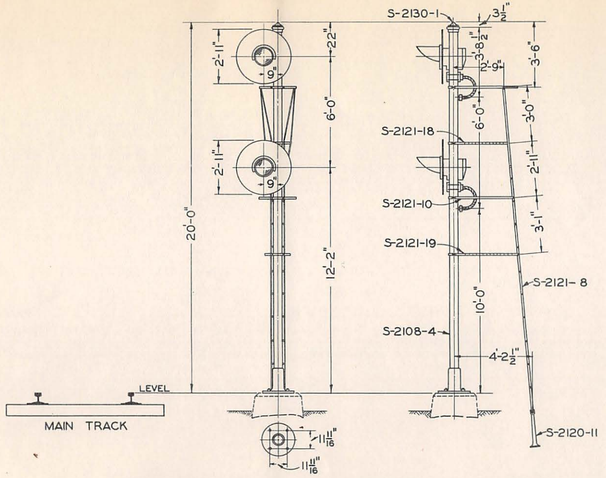
STANDARD COLOR LIGHT SEARCHLIGHT GROUND SIGNAL, ONE UNIT HEIGHT MAST

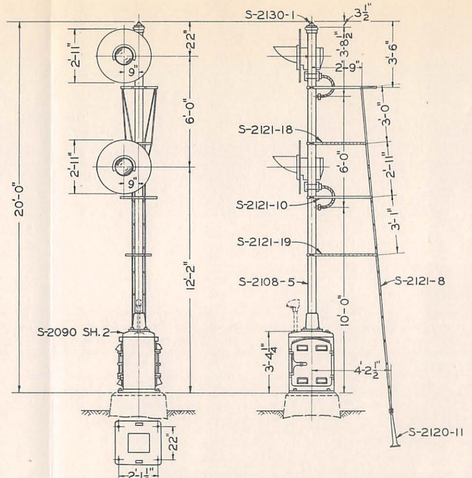
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 27, 1933
CHIEF ENGINEER

S-2105



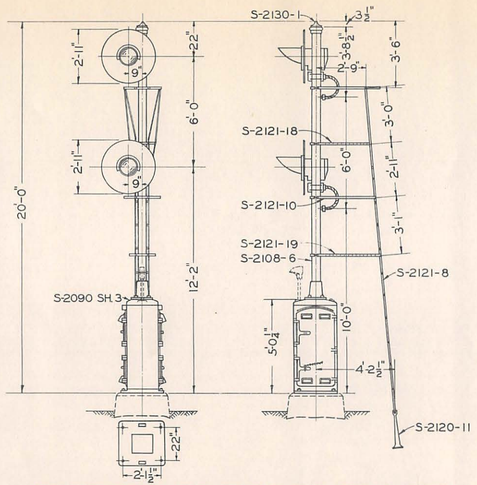
TWO UNIT COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

TWO OPERATIVE UNITS	ONE OPERATIVE UNIT AND ONE INOPERATIVE UNIT	DESCRIPTION
S-2106-1	S-2106-2	TWO UNIT SEARCHLIGHT GROUND SIGNAL FOR MOUNTING ON CONCRETE FOUNDATION COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS



TWO UNIT COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

TWO OPERATIVE UNITS	ONE OPERATIVE UNIT AND ONE INOPERATIVE UNIT	DESCRIPTION
S-2106-3	S-2106-4	TWO UNIT SEARCHLIGHT GROUND SIGNAL WITH INSTRUMENT CASE 3'-4½" HIGH, COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING S-2090-31 OR 2" CABLE OUTLET S-2090-22



TWO UNIT COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

TWO OPERATIVE UNITS	ONE OPERATIVE UNIT AND ONE INOPERATIVE UNIT	DESCRIPTION
S-2106-5	S-2106-6	TWO UNIT SEARCHLIGHT GROUND SIGNAL WITH INSTRUMENT CASE 5'-0¼" HIGH, COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING S-2090-32 OR 2" CABLE OUTLET S-2090-22

NOTES

1. EACH OPERATIVE SIGNAL UNIT SHALL BE FURNISHED WITH ONE 2" I. D. DOUBLE STRIP GALV. FLEXIBLE CONDUIT AND FITTINGS.
2. EACH INOPERATIVE SIGNAL UNIT SHALL BE FURNISHED WITH ONE ¾" I. D. DOUBLE STRIP GALV. FLEXIBLE CONDUIT, FITTINGS AND 2" x ¾" REDUCING BUSHING.
3. SIGNAL UNITS MAY BE ASSEMBLED ON EITHER SIDE OF MAST TO MEET REQUIREMENTS.

SCALE IN FEET
0 1 2 3 4 5 6 7 8

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C.H.W.		

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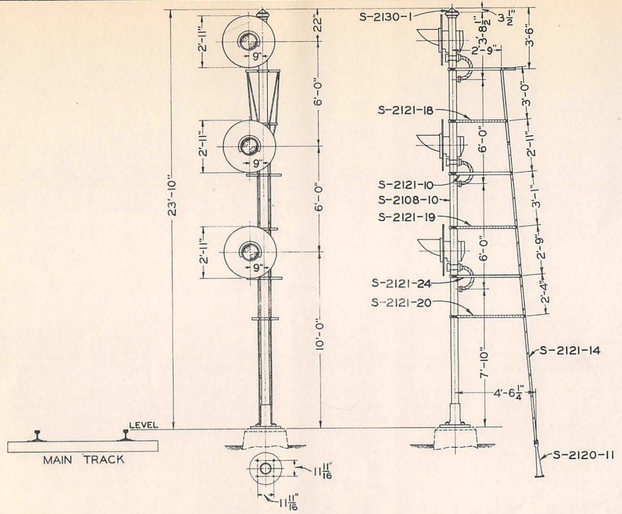
STANDARD COLOR LIGHT SEARCHLIGHT GROUND SIGNAL, TWO UNIT HEIGHT MAST

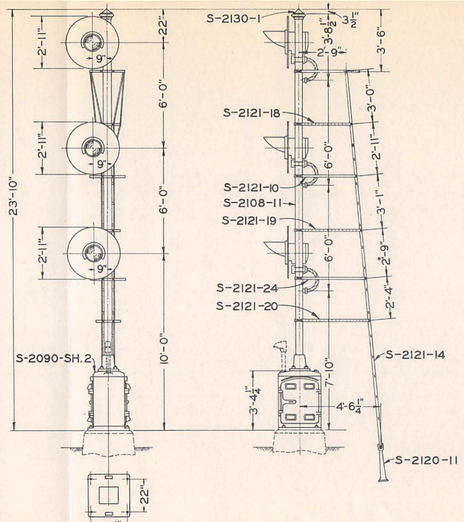
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: ..... JUNE 27, 1933
CHIEF ENGINEER

S-2106



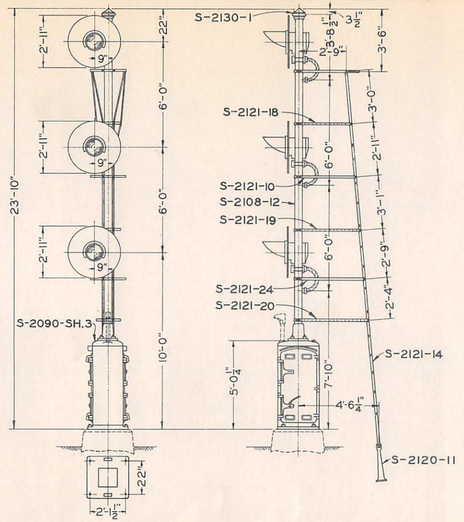
THREE UNIT COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

THREE OPERATIVE UNITS	TWO OPERATIVE UNITS AND ONE INOPERATIVE UNIT	ONE OPERATIVE UNIT AND TWO INOPERATIVE UNITS	DESCRIPTION
S-2107-1	S-2107-2	S-2107-3	THREE UNIT SEARCHLIGHT GROUND SIGNAL FOR MOUNTING ON CONCRETE FOUNDATION COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS.



THREE UNIT COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

THREE OPERATIVE UNITS	TWO OPERATIVE UNITS AND ONE INOPERATIVE UNIT	ONE OPERATIVE UNIT AND TWO INOPERATIVE UNITS	DESCRIPTION
S-2107-4	S-2107-5	S-2107-6	THREE UNIT SEARCHLIGHT GROUND SIGNAL WITH INSTRUMENT CASE 3'-4½" HIGH COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING S-2090-31 OR 2" CABLE OUTLET S-2090-22



THREE UNIT COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

THREE OPERATIVE UNITS	TWO OPERATIVE UNITS AND ONE INOPERATIVE UNIT	ONE OPERATIVE UNIT AND TWO INOPERATIVE UNITS	DESCRIPTION
S-2107-7	S-2107-8	S-2107-9	THREE UNIT SEARCHLIGHT GROUND SIGNAL WITH INSTRUMENT CASE 5'-0¼" HIGH COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING S-2090-32 OR 2" CABLE OUTLET S-2090-22

NOTES

1. EACH OPERATIVE SIGNAL UNIT SHALL BE FURNISHED WITH ONE 2" I.D. DOUBLE STRIP GALV. FLEXIBLE CONDUIT AND FITTINGS.
2. EACH INOPERATIVE SIGNAL UNIT SHALL BE FURNISHED WITH ONE ¾" I.D. DOUBLE STRIP GALV. FLEXIBLE CONDUIT, FITTINGS AND 2" X ¾" REDUCING BUSHING.

SCALE IN FEET
0 1 2 3 4 5 6 7 8

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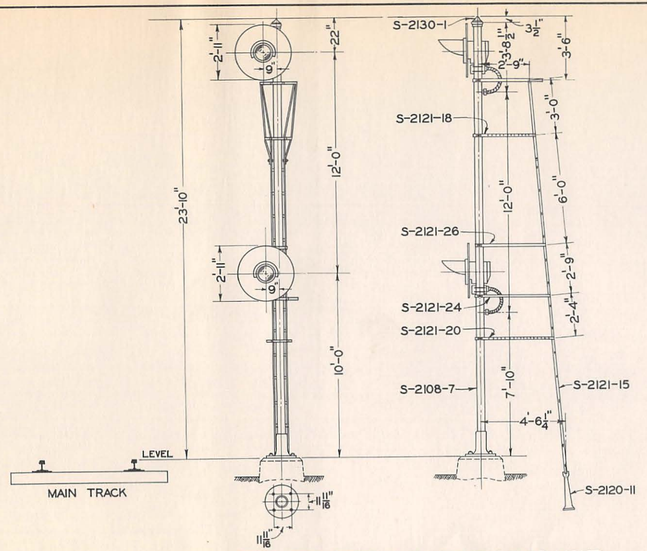
STANDARD COLOR LIGHT SEARCHLIGHT GROUND SIGNAL, THREE UNIT HEIGHT MAST

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: _____ CHIEF ENGINEER JUNE 27, 1933

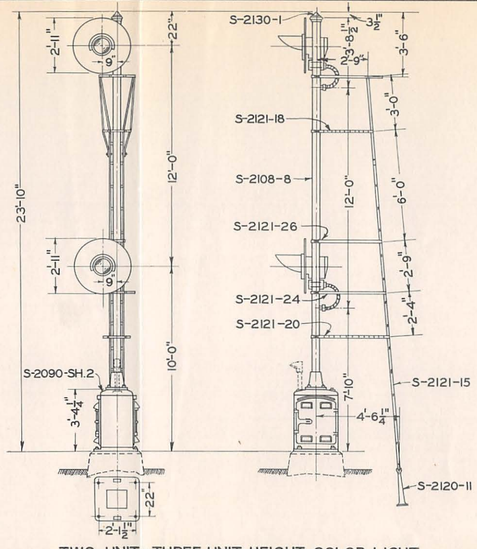
SHEET 1 OF 2

S-2107



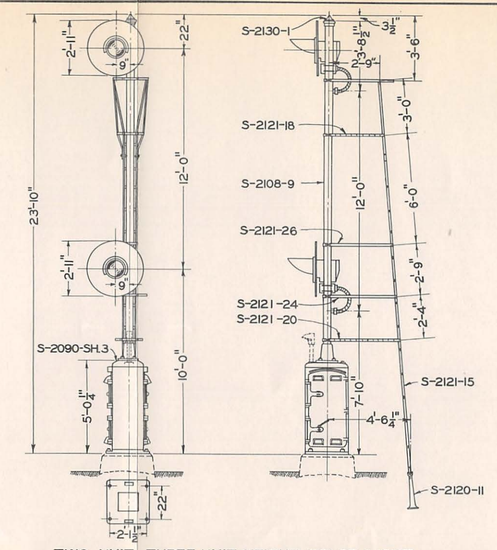
TWO UNIT-THREE UNIT HEIGHT COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

TWO OPERATIVE UNITS	ONE OPERATIVE UNIT AND ONE INOPERATIVE UNIT	DESCRIPTION
S-2107-10	S-2107-11	TWO UNIT-THREE UNIT HEIGHT SEARCH-LIGHT GROUND SIGNAL FOR MOUNTING ON CONCRETE FOUNDATION COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS



TWO UNIT-THREE UNIT HEIGHT COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

TWO OPERATIVE UNITS	ONE OPERATIVE UNIT AND ONE INOPERATIVE UNIT	DESCRIPTION
S-2107-12	S-2107-13	TWO UNIT-THREE UNIT HEIGHT SEARCH-LIGHT GROUND SIGNAL WITH INSTRUMENT CASE 3-4 1/4" HIGH COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING S-2090-31 OR 2" CABLE OUTLET S-2090-22



TWO UNIT-THREE UNIT HEIGHT COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

TWO OPERATIVE UNITS	ONE OPERATIVE UNIT AND ONE INOPERATIVE UNIT	DESCRIPTION
S-2107-14	S-2107-15	TWO UNIT-THREE UNIT HEIGHT SEARCH-LIGHT GROUND SIGNAL WITH INSTRUMENT CASE 5-0 1/2" HIGH COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING S-2090-32 OR 2" CABLE OUTLET S-2090-22

NOTES

1. EACH OPERATIVE SIGNAL UNIT SHALL BE FURNISHED WITH ONE 2" I.D. DOUBLE STRIP GALV. FLEXIBLE CONDUIT AND FITTINGS.
2. EACH INOPERATIVE SIGNAL UNIT SHALL BE FURNISHED WITH ONE 3 1/2" I.D. DOUBLE STRIP GALV. FLEXIBLE CONDUIT, FITTINGS AND 2" X 3 1/2" REDUCING BUSHING.

SCALE IN FEET
0 1 2 3 4 5 6 7 8

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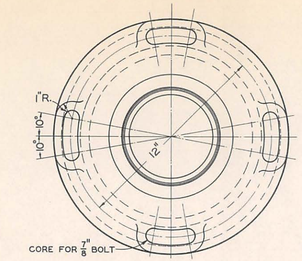
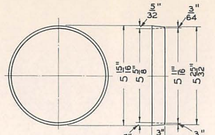
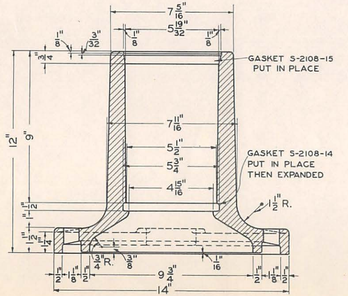
STANDARD COLOR LIGHT SEARCHLIGHT GROUND SIGNAL, THREE UNIT HEIGHT MAST

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 27, 1933
CHIEF ENGINEER

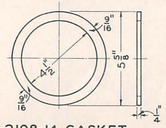
SHEET 2 OF 2
S-2107

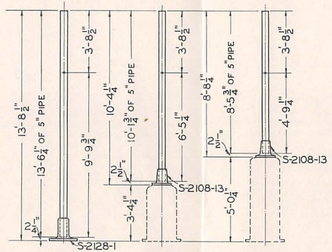




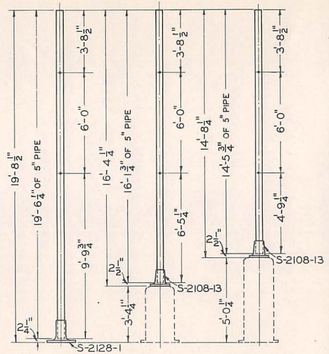


S-2108-13 SOCKET FOR 5 INCH PIPE WITH GASKETS
PRESS FIT
CAST IRON
SCALE ②

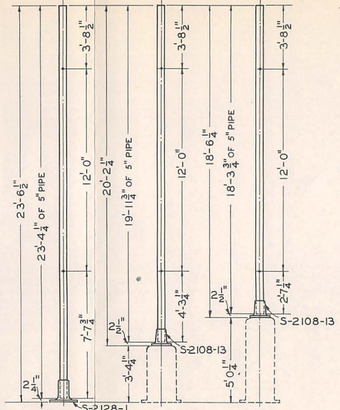




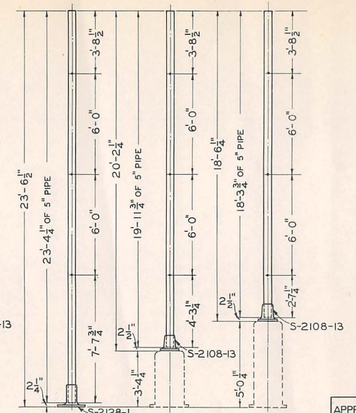
ONE UNIT MASTS
SCALE ①



TWO UNIT MASTS
SCALE ①



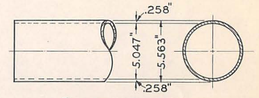
TWO UNIT- THREE UNIT HEIGHT MASTS
SCALE ①



THREE UNIT MASTS
SCALE ①

NOTES

1. HOLES FOR CONDUIT OUTLET SHALL BE DRILLED AND TAPPED FOR 2" PANEL BOX CONNECTOR LOCATED ON CENTER LINE OF MASTS AS SHOWN.
2. MASTS SHALL HAVE PURCHASER'S DRAWING NUMBER PAINTED ON BOTTOM OF BASE BEFORE SHIPMENT.
3. MASTS SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT FINISHING COAT OF BLACK ON EXTERIOR SURFACES SHALL BE OMITTED.



5" PIPE SECTION
WROUGHT IRON OR STEEL
SCALE ③

SCALE IN INCHES

①	0	12	24	36	48	60	72	84	96				
②	0	1	2	3	4	5	6	7	8				
③	0	1	2	3	4	5	6	7	8	9	10	11	12

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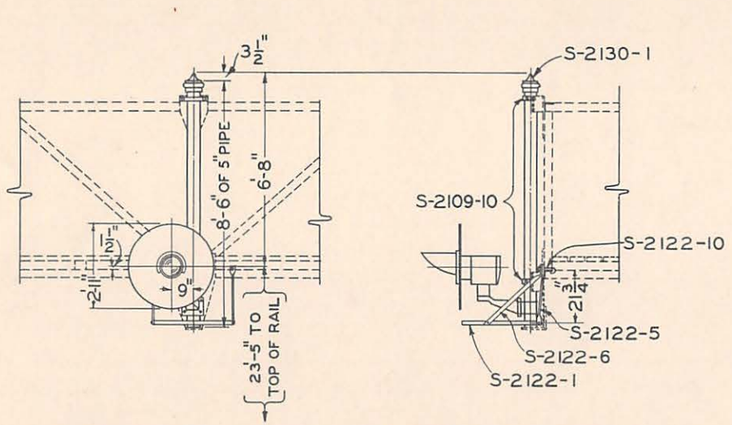
STANDARD MASTS FOR COLOR LIGHT SEARCHLIGHT GROUND SIGNALS

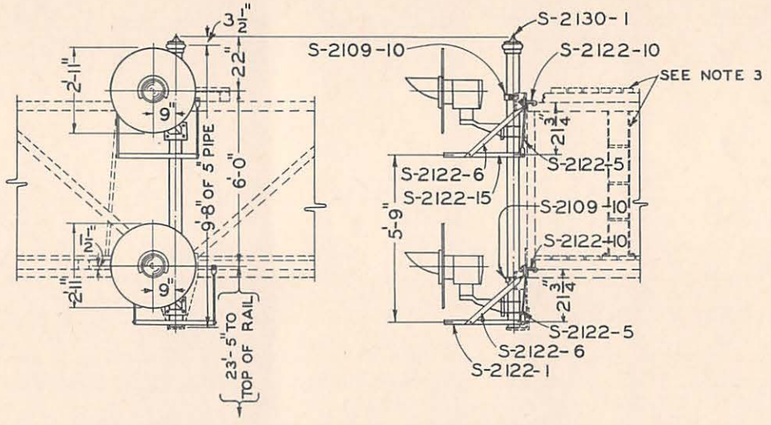
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: ..... JUNE 27, 1933
CHIEF ENGINEER

S-2108



S-2109-1 ONE UNIT COLOR LIGHT SEARCHLIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMP

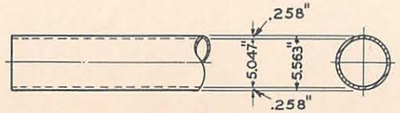
SCALE ②



TWO UNIT COLOR LIGHT SEARCHLIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS

SCALE ②

TWO OPERATIVE UNITS	ONE OPERATIVE UNIT AND ONE INOPERATIVE UNIT
S-2109-2	S-2109-3



5" PIPE SECTION

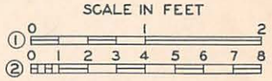
WROUGHT IRON OR STEEL

SCALE ①

NOTES

1. SIGNALS MAY BE ASSEMBLED WITH UNITS ON EITHER SIDE OF MAST, AS REQUIRED.
2. TOP PLATFORM MAY BE ASSEMBLED WITH TOP SIGNAL UNIT ON EITHER SIDE OF MAST BY INVERTING PLATFORM.
3. LADDER IS NOT INCLUDED IN SIGNAL ASSEMBLY. FOR DETAILS OF HANDRAIL, LADDER, AND PLATFORM ARRANGEMENT SEE STANDARD DRAWING S-2123.
4. SIGNAL ASSEMBLIES ARE FOR APPLICATION TO STANDARD TWO, THREE, AND FOUR TRACK SIGNAL BRIDGE, S-2995.
5. MASTS SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT FINISHING COAT OF BLACK ON EXTERIOR SURFACES SHALL BE OMITTED.
6. EACH OPERATIVE UNIT SHALL BE FURNISHED WITH ONE 2" BUSHING AND EACH INOPERATIVE UNIT SHALL BE FURNISHED WITH ONE ¾" BUSHING IN WIRE OUTLET.

SCALE IN FEET



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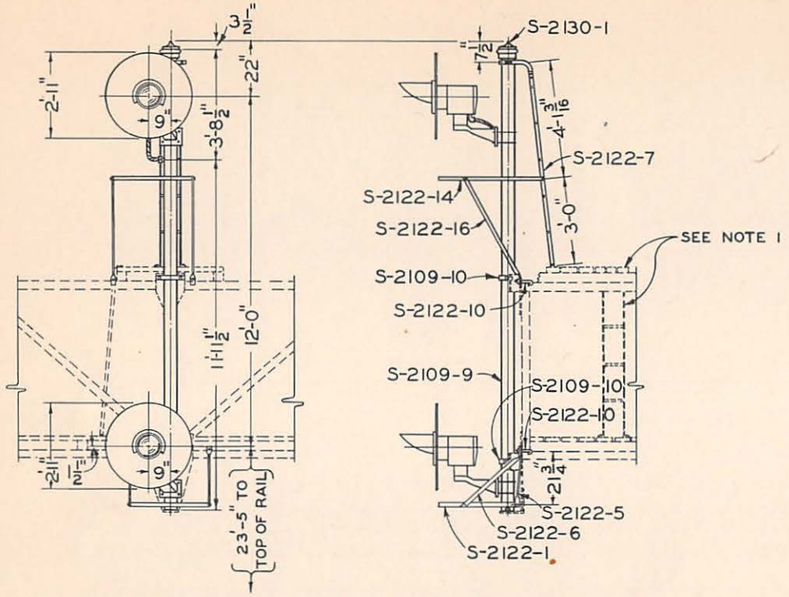
STANDARD COLOR LIGHT SEARCHLIGHT BRIDGE SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
CHAIRMAN
MARCH 15, 1943

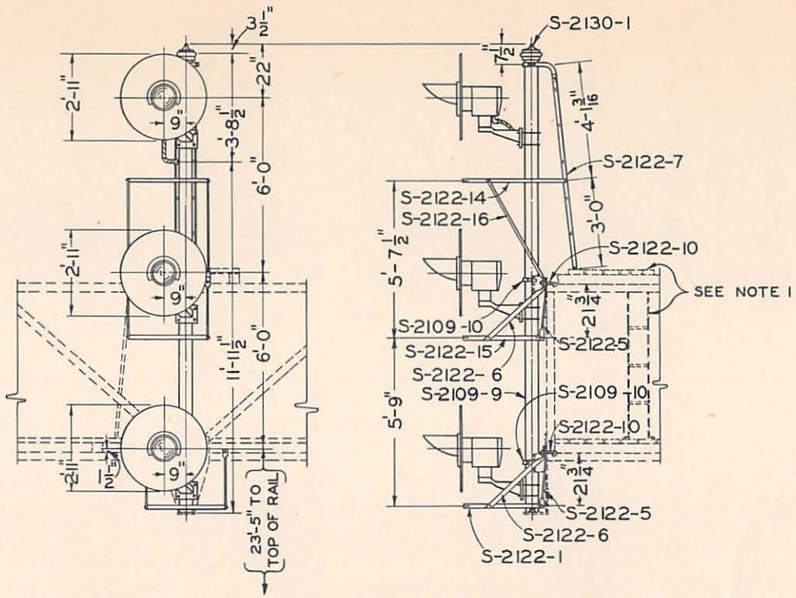


TWO UNIT-THREE UNIT HEIGHT COLOR LIGHT SEARCHLIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS

SCALE ②

TWO OPERATIVE UNITS	ONE OPERATIVE UNIT AND ONE INOPERATIVE UNIT
S-2109-4	*S-2109-5

*ORDER SHALL SPECIFY WHETHER TOP UNIT IS OPERATIVE OR INOPERATIVE, SEE NOTES 3, 4, AND 5



THREE UNIT COLOR LIGHT SEARCHLIGHT BRIDGE SIGNAL COMPLETE EXCEPT WITHOUT LAMPS

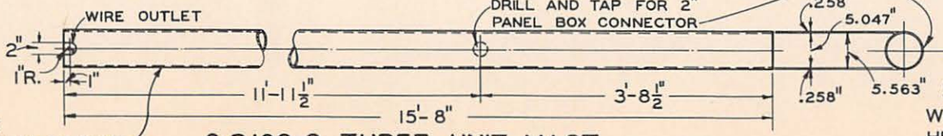
SCALE ②

THREE OPERATIVE UNITS	TWO OPERATIVE UNITS AND ONE INOPERATIVE UNIT	ONE OPERATIVE UNIT AND TWO INOPERATIVE UNITS
S-2109-6	*S-2109-7	*S-2109-8

NOTES

1. LADDER IS NOT INCLUDED IN SIGNAL ASSEMBLY. FOR DETAILS OF HANDRAIL, LADDER, AND PLATFORM ARRANGEMENT SEE STANDARD DRAWING S-2123.
2. SIGNAL ASSEMBLIES ARE FOR APPLICATION TO STANDARD TWO, THREE, AND FOUR TRACK SIGNAL BRIDGE, S-2995.
3. FOR MIDDLE AND BOTTOM UNITS, EACH OPERATIVE UNIT SHALL BE FURNISHED WITH ONE 2" BUSHING AND EACH INOPERATIVE UNIT SHALL BE FURNISHED WITH ONE $\frac{3}{4}$" BUSHING IN WIRE OUTLET.
4. EACH OPERATIVE TOP UNIT SHALL BE FURNISHED WITH ONE 2" I.D. DOUBLE STRIP GALV. FLEXIBLE CONDUIT AND FITTINGS.
5. EACH INOPERATIVE TOP UNIT SHALL BE FURNISHED WITH ONE $\frac{3}{4}$" I.D. DOUBLE STRIP GALV. FLEXIBLE CONDUIT, FITTINGS AND 2" x $\frac{3}{4}$" REDUCING BUSHING.
6. MASTS SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT FINISHING COAT OF BLACK ON EXTERIOR SURFACES SHALL BE OMITTED.

SCALE IN FEET

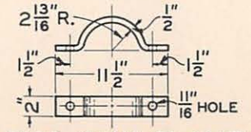


PURCHASER'S DRAWING NUMBER SHALL BE PAINTED ON MAST

S-2109-9 THREE UNIT MAST

WROUGHT IRON OR STEEL

SCALE ①



S-2109-10 W.I. CLAMP WITH 2-$\frac{5}{8}$"x3$\frac{1}{2}$" SQ. HD. BOLTS, HEX. NUTS, AND $\frac{3}{16}$"x$\frac{3}{16}$" SPRING WASHERS

SCALE ③

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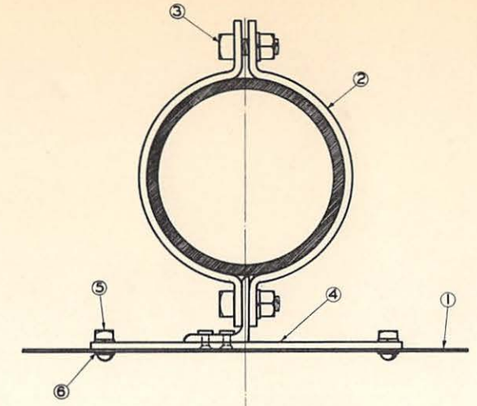
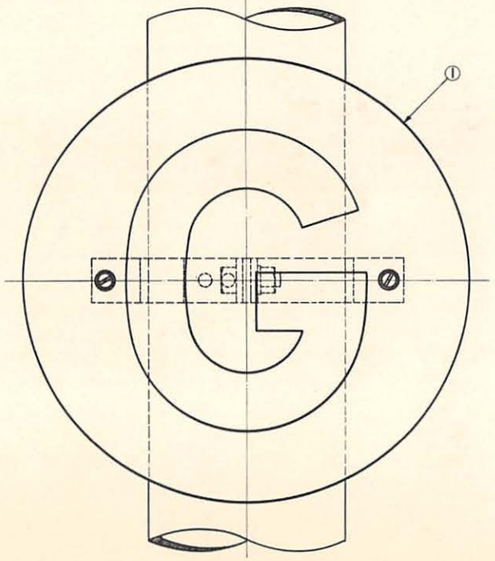
STANDARD COLOR LIGHT SEARCHLIGHT BRIDGE SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. C. Wallace
CHAIRMAN
MARCH 15, 1943

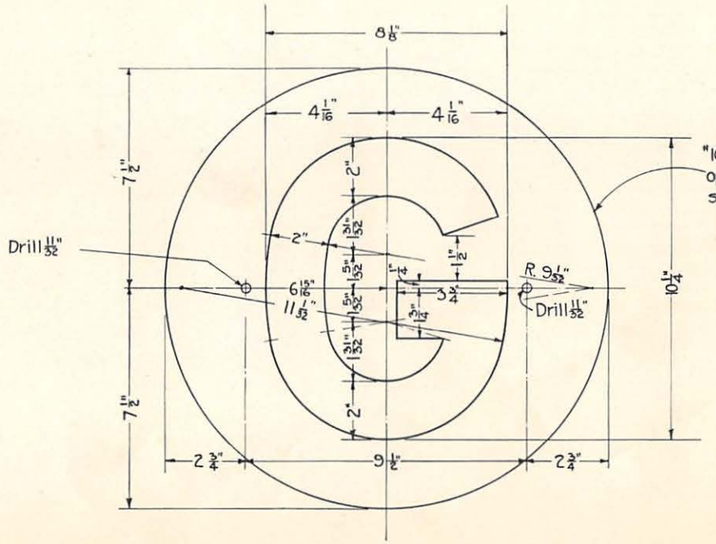
S-2110-1 MARKER COMP. WITH LETTER "G" FOR 5" PIPE
S-2110-2 " " " " " " " 6" "
S-2110-3 " " " WITHOUT " " " " 5" "
S-2110-4 " " " " " " " " 6" "

FIGURE	QUANTITY REQUIRED				DESCRIPTION OF MATERIAL	DRAWING NUMBER
①			1	1	DISC WITH LETTER "G"	S-2110-5
	1	1			DISC WITHOUT LETTER "G"	S-2110-6
②		2		2	ONE HALF CLAMP FOR 5" PIPE	S-2112-2
	2		2		" " " " " 6" "	S-2112-1
③	2	2	2	2	$\frac{1}{2}$" X $1\frac{1}{2}$" SQ. HEAD BOLT WITH HEX. NUT AND LOCK WASHER	
④	1	1	1	1	BACKSTRAP AND ANGLE IRON COMPLETE	S-2112-3
⑤	2	2	2	2	$\frac{5}{16}$"X $\frac{3}{4}$" BRASS R.H. BOLT WITH SQ. NUT AND LOCK WASHER	
⑥	2	2	2	2	18 GAGE BRASS WASHER	S-2112-6





ASSEMBLY



"16 U.S. Standard gage open hearth enameling steel.

S-2110-5 DISC WITH LETTER "G" SEE NOTE 1
S-2110-6 DISC WITHOUT LETTER "G" SEE NOTE 2

NOTES

1. Front of disc shall be Standard Semaphore Yellow Porcelain Enameled and the Letter "G" shall be Black Porcelain Enameled. Back of disc shall be Black Porcelain Enameled.
2. Front of disc without Letter "G" shall be Standard Semaphore Yellow Porcelain Enameled. Back of disc same as Note 1.
3. Colored sample, upon request, will be furnished manufacturer by purchaser.

SCALE IN INCHES
0 1 2 3 4 5 6 7 8

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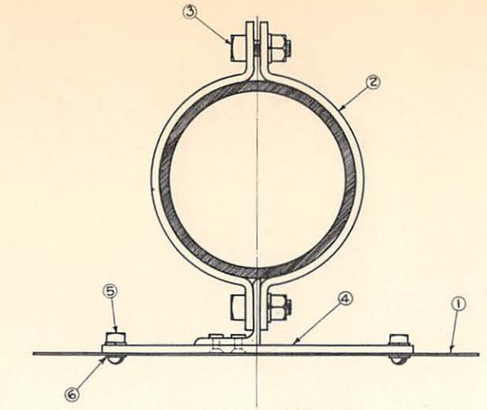
STANDARD MARKER FOR GRADE SIGNALS

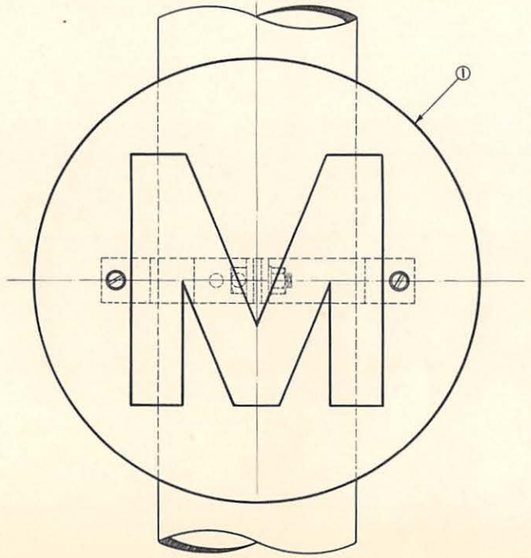
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: CHIEF ENGINEER MAR. 17, 1931

S-2110

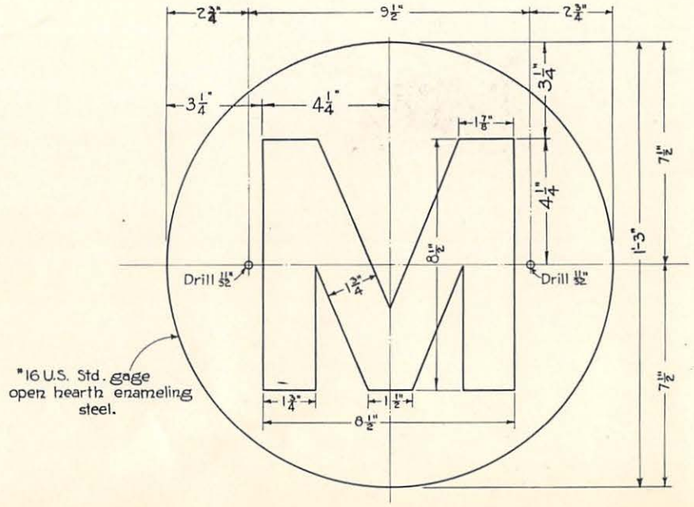
S-2111-1 MARKER COMP. WITH LETTER "M" FOR 5" PIPE
S-2111-2 " " " " " " " " 6" " "

FIGURE	QUANTITY		DESCRIPTION OF MATERIAL	DRAWING NUMBER
①	1	1	DISC WITH LETTER "M"	S-2111-3
②		2	ONE HALF CLAMP FOR 5" PIPE	S-2112-2
	2		" " " " 6" "	S-2112-1
③	2	2	½" x 1½" SQ. HEAD BOLT WITH HEX. NUT AND LOCK WASHER	
④	1	1	BACKSTRAP AND ANGLE IRON COMPLETE	S-2112-3
⑤	2	2	5/16" x 3/4" BRASS R.H. BOLT WITH SQ. NUT AND LOCK WASHER	
⑥	2	2	18 GAGE BRASS WASHER	S-2112-6





ASSEMBLY



S-2111-3 DISC WITH LETTER "M" SEE NOTE

NOTE

Front of disc shall be Standard Semaphore White Porcelain Enameled and the letter "M" shall be Black Porcelain Enameled. Back of disc shall be Black Porcelain Enameled.

SCALE IN INCHES
0 1 2 3 4 5 6 7 8

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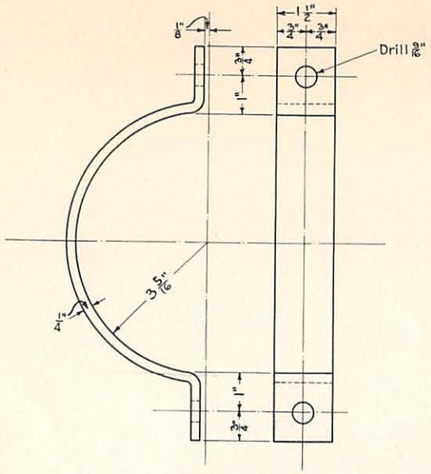
STANDARD MARKER FOR MANUAL BLOCK SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E.H. Mitchell CHIEF ENGINEER MAR. 17, 1931

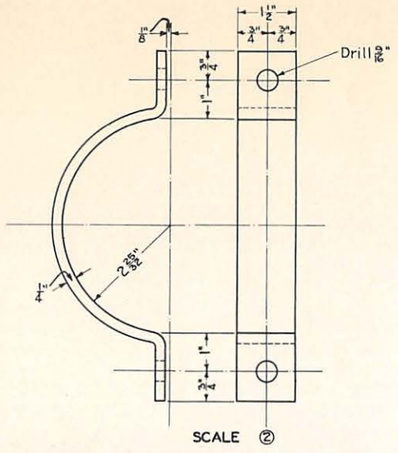
S-2111



SCALE ②

S-2112-1 ONE HALF CLAMP FOR 6 INCH PIPE

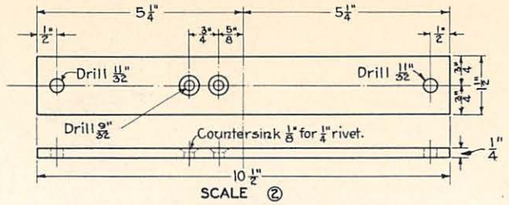
OPEN HEARTH STEEL



SCALE ②

S-2112-2 ONE HALF CLAMP FOR 5 INCH PIPE

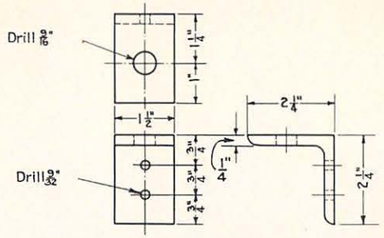
OPEN HEARTH STEEL



SCALE ②

S-2112-4 BACKSTRAP

OPEN HEARTH STEEL



SCALE ②

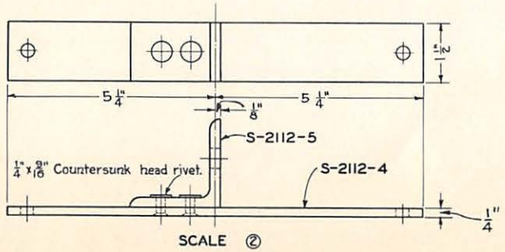
S-2112-5 ANGLE IRON

HOT ROLLED STEEL

SCALE ①

S-2112-6 WASHER

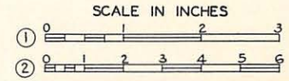
NO. 18 B&S BRASS



SCALE ②

S-2112-3 BACKSTRAP COMPLETE

SCALE IN INCHES



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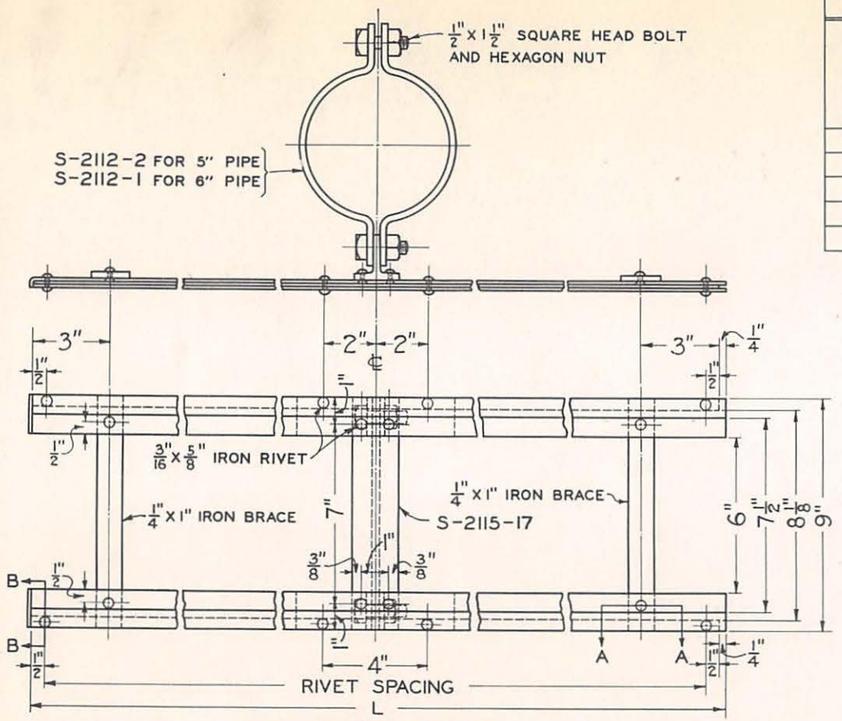
STANDARD CLAMPS AND BACKSTRAP FOR SIGNAL MARKERS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: C. D. Mitchell CHIEF ENGINEER MAR. 17, 1931

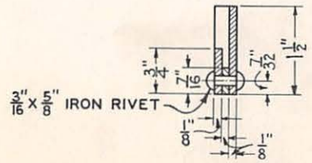
S-2112



HORIZONTAL RACKS

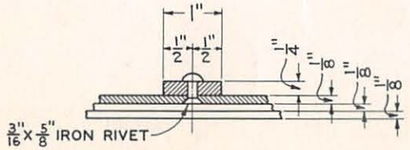
O.-H. STEEL (SHERARDIZED)

SCALE ①



SECTION B-B

SCALE ②



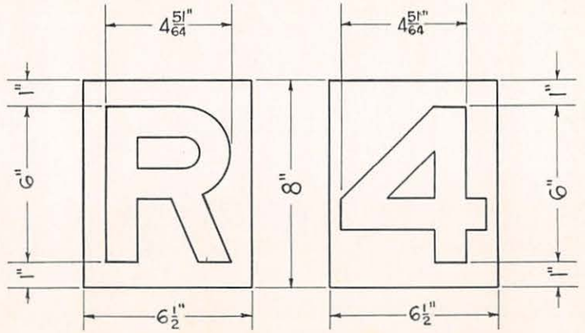
SECTION A-A

SCALE ②

HORIZONTAL RACKS					
DRAWING REFERENCE, RACK LESS HALF CLAMPS AND BOLTS.	FOR 5" PIPE: DRAWING REFERENCE, RACK COMPLETE WITH 4, S-2112-2 HALF CLAMPS AND 4 BOLTS.	FOR 6" PIPE: DRAWING REFERENCE, RACK COMPLETE WITH 4, S-2112-1 HALF CLAMPS AND 4 BOLTS.	NUMBER OF CHARACTERS	LENGTH "L"	RIVET SPACING
S-2115-2	S-2115-7	S-2115-12	2	13 1/4"	4"-4"-4"
S-2115-3	S-2115-8	S-2115-13	3	19 3/4"	3 1/4"-4"-4"-4"-3 1/4"
S-2115-4	S-2115-9	S-2115-14	4	2'-2 1/4"	3 1/4"-3 1/4"-4"-4"-4"-3 1/4"-3 1/4"
S-2115-5	S-2115-10	S-2115-15	5	2'-8 3/4"	3 1/4"-3 1/4"-3 1/4"-4"-4"-4"-3 1/4"-3 1/4"-3 1/4"
S-2115-6	S-2115-11	S-2115-16	6	3'-3 1/4"	3 1/4"-3 1/4"-3 1/4"-3 1/4"-4"-4"-4"-3 1/4"-3 1/4"-3 1/4"-3 1/4"

NOTES

1. BACK OF ALL LETTER AND NUMBER PLATES SHALL BE BLACK PORCELAIN ENAMELED; LETTER OR NUMERAL ON FRONT SHALL BE STANDARD SEMAPHORE WHITE PORCELAIN ENAMELED ON BLACK PORCELAIN ENAMELED BACKGROUND.
2. PAINTING OF RACK SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. LETTERS AND NUMERALS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD DRAWING R-549, STANDARD LETTERS AND FIGURES FOR SIGNS.
4. PLATES S-2115-1 SHALL BE ORDERED SEPARATELY, SPECIFYING LETTERS OR NUMERALS DESIRED.
5. SIGNAL LOCATIONS TAKE THEIR PRIMARY NUMBER FROM THE LOW NUMBERED MILE IN WHICH THEY ARE LOCATED. TO THE MILE NUMBER SHALL BE AFFIXED AN ODD DIGIT FOR WESTWARD OR NORTHWARD AND AN EVEN DIGIT FOR EASTWARD OR SOUTHWARD SIGNAL. WHERE PARALLEL TRACKS ARE SIGNALED FOR OPERATION IN THE SAME DIRECTION, AN ADDITIONAL DIGIT MAY BE USED TO DESIGNATE THE TRACK NUMBER. A LETTER SHALL BE USED IN CONNECTION WITH THE NUMBER TO DESIGNATE SIGNALS ON BRANCH LINES.



S-2115-1 LETTER OR NUMBER PLATE

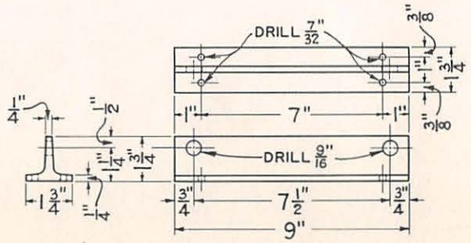
NO. 16 U.S. STANDARD GAGE OPEN-HEARTH ENAMELING STEEL

SCALE ①

SCALE IN INCHES

① 0 1 2 3 4 5 6 7 8 9

② 0 1 2 3 4



S-2115-17 RACK SUPPORT

3.09 LBS. PER FOOT

O.-H. STEEL (SHERARDIZED)

SCALE ①

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D. B. Booooh
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C.B.P.		

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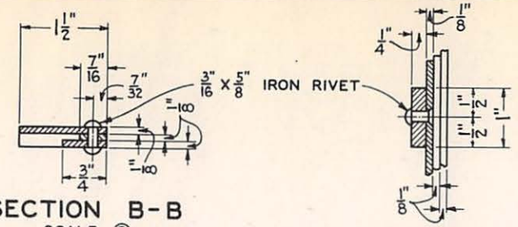
PERE MARQUETTE RAILWAY COMPANY

STANDARD NUMBER PLATES AND RACKS FOR AUTOMATIC SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: E. E. Marshall, CHIEF ENGINEER — NOV. 5, 1936

SHEET 1 OF 3
S-2115-A



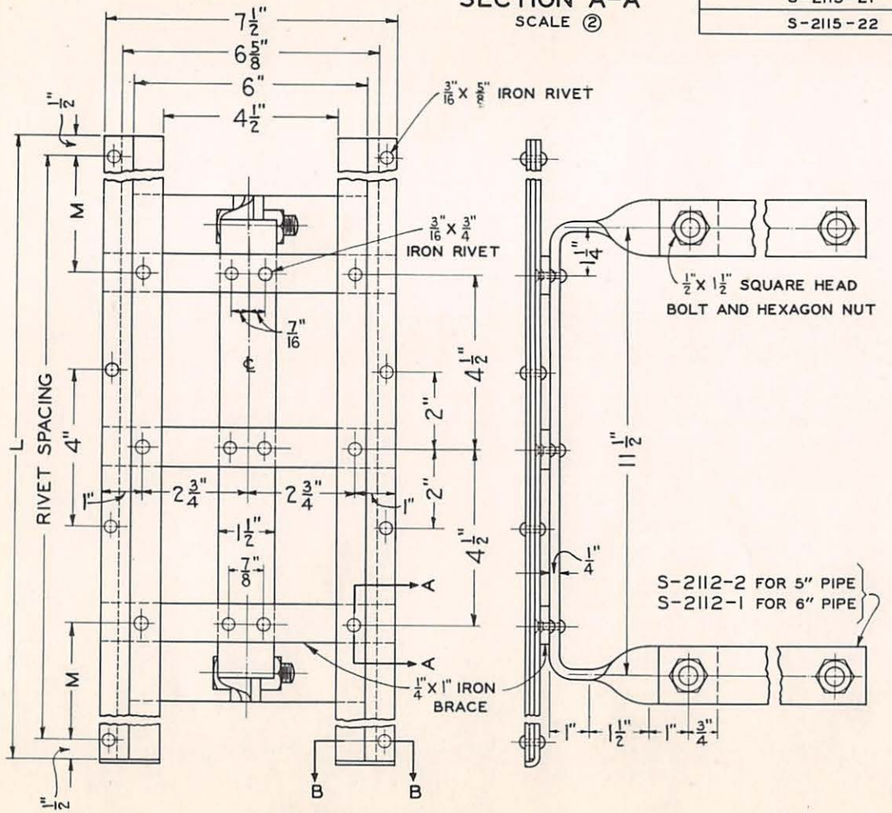
SECTION B-B
SCALE ②

SECTION A-A
SCALE ②

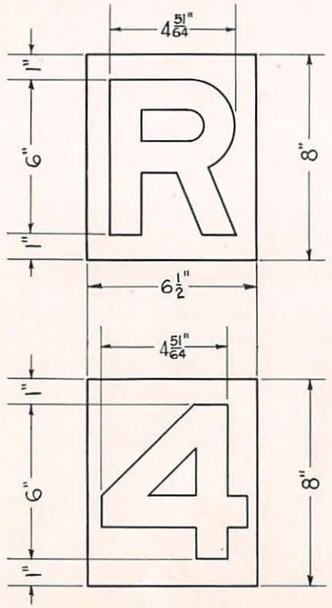
VERTICAL RACKS FOR NUMBER WITHOUT DASH						
DRAWING REFERENCE, RACK LESS HALF CLAMPS AND BOLTS.	FOR 5" PIPE: DRAWING REFERENCE, RACK COMPLETE WITH 4, S-2112-2 HALF CLAMPS AND 4 BOLTS.	FOR 6" PIPE: DRAWING REFERENCE, RACK COMPLETE WITH 4, S-2112-1 HALF CLAMPS AND 4 BOLTS.	NUMBER OF CHARACTERS	LENGTH "L"	RIVET SPACING	DIMENSION "M"
S-2115-18	S-2115-23	S-2115-28	2	16"	5½" - 4" - 5½"	3"
S-2115-19	S-2115-24	S-2115-29	3	24"	5½" - 4" - 4" - 4" - 5½"	7"
S-2115-20	S-2115-25	S-2115-30	4	2'-8"	5½" - 4" - 4" - 4" - 4" - 4" - 5½"	11"
S-2115-21	S-2115-26	S-2115-31	5	3'-4"	5½" - 4" - 4" - 4" - 4" - 4" - 4" - 5½"	15"
S-2115-22	S-2115-27	S-2115-32	6	4'-0"	5½" - 4" - 4" - 4" - 4" - 4" - 4" - 4" - 4" - 5½"	19"

NOTES

1. BACK OF ALL LETTER AND NUMBER PLATES SHALL BE BLACK PORCELAIN ENAMELED; LETTER OR NUMERAL ON FRONT SHALL BE STANDARD SEMAPHORE WHITE PORCELAIN ENAMELED ON BLACK PORCELAIN ENAMELED BACKGROUND.
2. PAINTING OF RACK SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. LETTERS AND NUMERALS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD DRAWING R-549, STANDARD LETTERS AND FIGURES FOR SIGNS.
4. PLATES S-2115-1 SHALL BE ORDERED SEPARATELY, SPECIFYING LETTERS OR NUMERALS DESIRED.
5. SIGNAL LOCATIONS TAKE THEIR PRIMARY NUMBER FROM THE LOW NUMBERED MILE IN WHICH THEY ARE LOCATED. TO THE MILE NUMBER SHALL BE AFFIXED AN ODD DIGIT FOR WESTWARD OR NORTHWARD AND AN EVEN DIGIT FOR EASTWARD OR SOUTHWARD SIGNAL. WHERE PARALLEL TRACKS ARE SIGNALED FOR OPERATION IN THE SAME DIRECTION, AN ADDITIONAL DIGIT MAY BE USED TO DESIGNATE THE TRACK NUMBER. A LETTER SHALL BE USED IN CONNECTION WITH THE NUMBER TO DESIGNATE SIGNALS ON BRANCH LINES.



VERTICAL RACKS
FOR NUMBER WITHOUT DASH
O.-H. STEEL (SHERARDIZED)
SCALE ③



S-2115-1 LETTER OR NUMBER PLATE
NO. 16 U.S. STANDARD GAGE OPEN-HEARTH ENAMELING STEEL
SCALE ①

SCALE IN INCHES
① 0 1 2 3 4 5 6 7 8 9
② 0 1 2 3 4
③ 0 1 2 3 4 5 6

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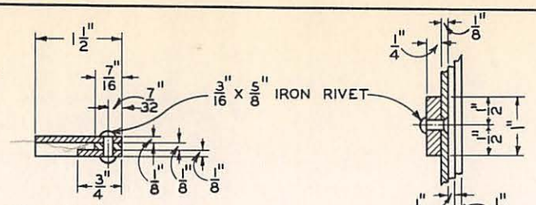
STANDARD NUMBER PLATES AND RACKS FOR AUTOMATIC SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: NOV. 5, 1936
CHIEF ENGINEER



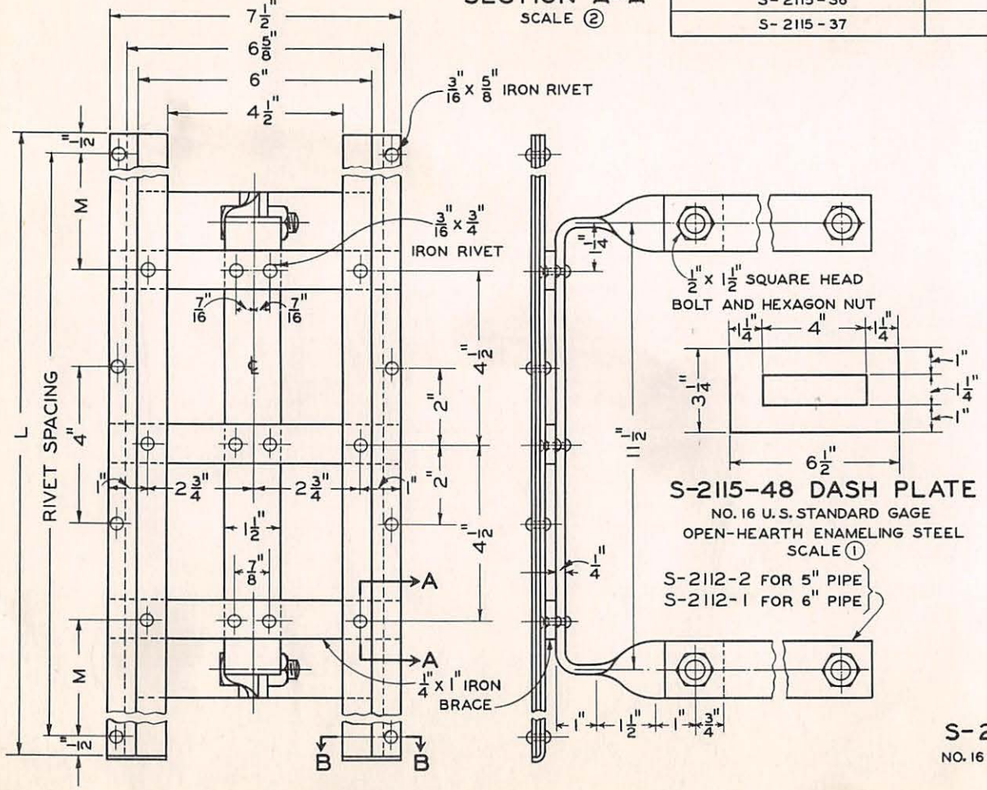
SECTION B-B
SCALE ②

SECTION A-A
SCALE ②

VERTICAL RACKS FOR NUMBER WITH DASH						
DRAWING REFERENCE, RACK LESS HALF CLAMPS AND BOLTS.	FOR .5" PIPE: DRAWING REFERENCE, RACK COMPLETE WITH 4, S-2112-2 HALF CLAMPS AND 4 BOLTS.	FOR 6" PIPE: DRAWING REFERENCE, RACK COMPLETE WITH 4, S-2112-1 HALF CLAMPS AND 4 BOLTS.	NUMBER OF CHARACTERS IN ADDITION TO DASH	LENGTH "L"	RIVET SPACING	DIMENSION "M"
S-2115-33	S-2115-38	S-2115-43	2	19¼"	3⅛"-4"-4"-4"-3⅛"	4⅝"
S-2115-34	S-2115-39	S-2115-44	3	2'-3¼"	3⅛"-4"-4"-4"-4"-3⅛"	8⅝"
S-2115-35	S-2115-40	S-2115-45	4	2'-11¼"	3⅛"-4"-4"-4"-4"-4"-4"-3⅛"	12⅝"
S-2115-36	S-2115-41	S-2115-46	5	3'-7¼"	3⅛"-4"-4"-4"-4"-4"-4"-4"-3⅛"	16⅝"
S-2115-37	S-2115-42	S-2115-47	6	4'-3¼"	3⅛"-4"-4"-4"-4"-4"-4"-4"-4"-4"-3⅛"	20⅝"

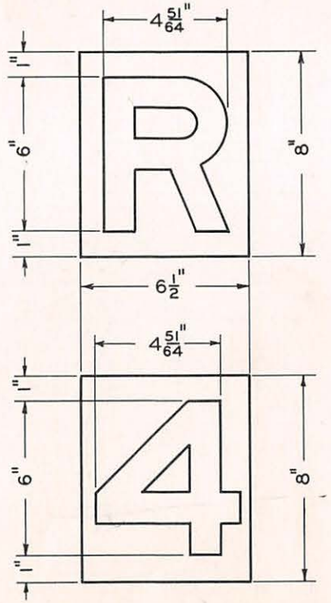
NOTES

1. BACK OF ALL LETTER, NUMBER, AND DASH PLATES SHALL BE BLACK PORCELAIN ENAMELED; LETTER, NUMERAL, OR DASH ON FRONT SHALL BE STANDARD SEMAPHORE WHITE PORCELAIN ENAMELED ON BLACK PORCELAIN ENAMELED BACKGROUND.
2. PAINTING OF RACK SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. LETTERS AND NUMERALS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD DRAWING R-549, STANDARD LETTERS AND FIGURES FOR SIGNS.
4. PLATES S-2115-1 AND S-2115-48 SHALL BE ORDERED SEPARATELY SPECIFYING LETTERS OR NUMERALS DESIRED.
5. SIGNAL LOCATIONS TAKE THEIR PRIMARY NUMBER FROM THE LOW NUMBERED MILE IN WHICH THEY ARE LOCATED. TO THE MILE NUMBER SHALL BE AFFIXED AN ODD DIGIT FOR WESTWARD OR NORTHWARD AND AN EVEN DIGIT FOR EASTWARD OR SOUTHWARD SIGNAL. WHERE PARALLEL TRACKS ARE SIGNALED FOR OPERATION IN THE SAME DIRECTION, AN ADDITIONAL DIGIT MAY BE USED TO DESIGNATE THE TRACK NUMBER. A LETTER SHALL BE USED IN CONNECTION WITH THE NUMBER TO DESIGNATE SIGNALS ON BRANCH LINES.



VERTICAL RACKS
FOR NUMBER WITH DASH
O.-H. STEEL (SHERARDIZED)
SCALE ③

S-2115-48 DASH PLATE
NO. 16 U.S. STANDARD GAGE
OPEN-HEARTH ENAMELING STEEL
SCALE ①



S-2115-1 LETTER OR NUMBER PLATE
NO. 16 U.S. STANDARD GAGE OPEN-HEARTH ENAMELING STEEL
SCALE ①

SCALE IN INCHES

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ERIE RAILROAD COMPANY
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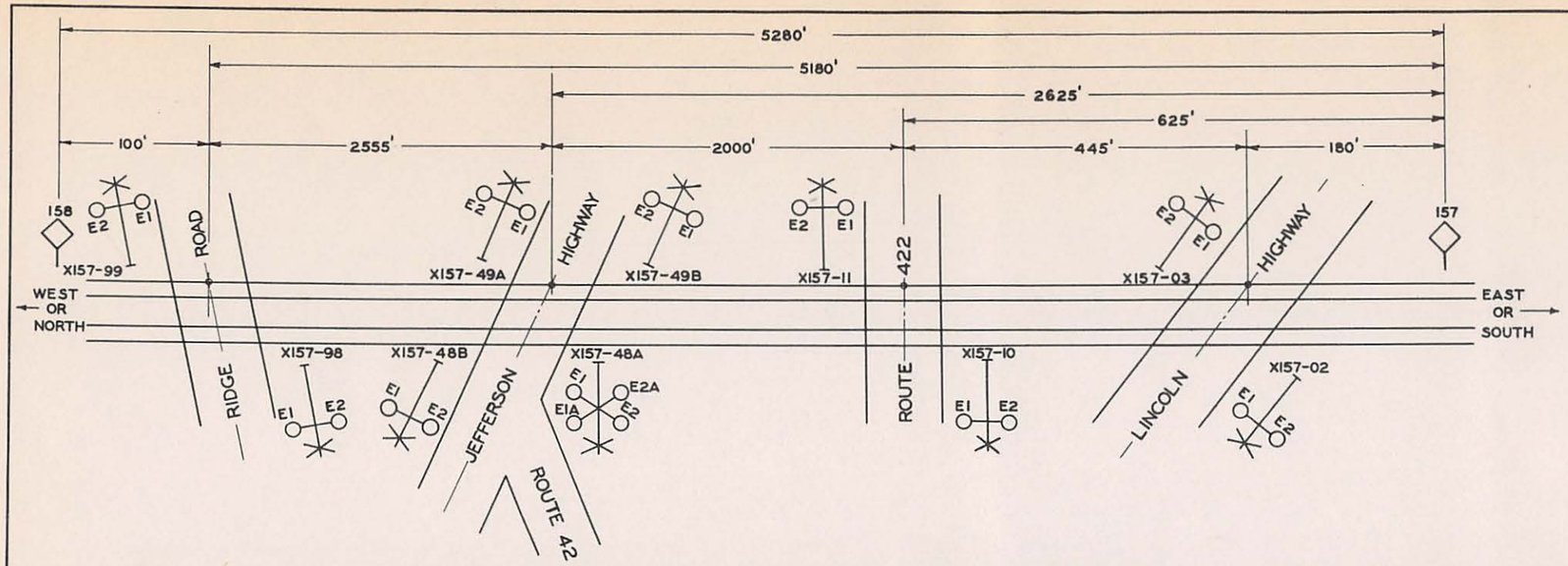
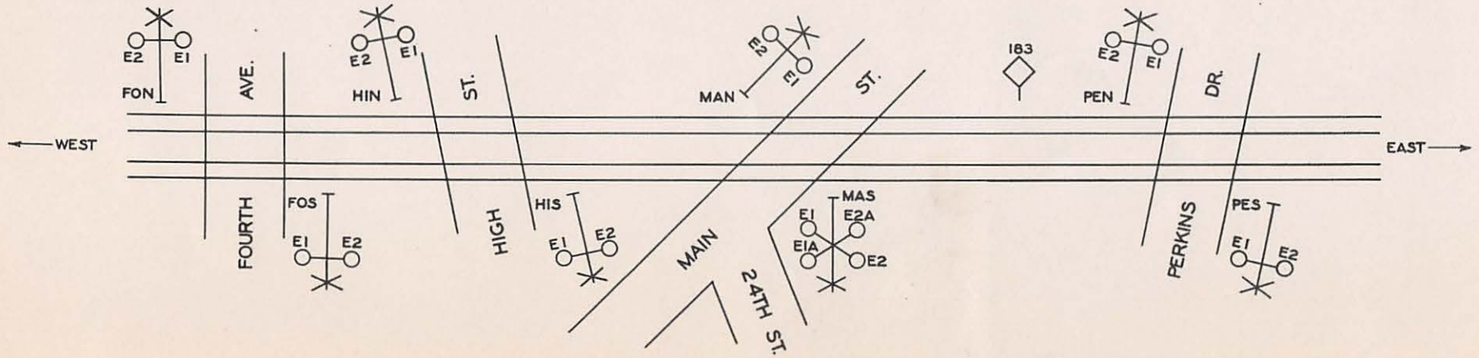
STANDARD NUMBER PLATES AND RACKS FOR AUTOMATIC SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: W Winchel CHIEF ENGINEER NOV. 5, 1936



S-2116-1 "HUNDREDTHS" SYSTEM OF NUMBERING CROSSING SIGNALS



S-2116-2 "NAMES" SYSTEM OF DESIGNATING CROSSING SIGNALS

NOTE

SYSTEM OF NUMBERING AS SHOWN ON THIS DRAWING IS FOR THE PURPOSE OF DESIGNATING THE LOCATION OF HIGHWAY CROSSING SIGNALS ON LAYOUT AND CIRCUIT PLANS.

NO SCALE

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ERIE RAILROAD COMPANY	R E Woodruff VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY	D Brooke VICE PRESIDENT
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K.L.M.	C.D.M. A.J.P.
K.L.M.	

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PERE MARQUETTE RAILWAY COMPANY

STANDARD HIGHWAY CROSSING SIGNAL NUMBERING

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: C D Mitchell CHIEF ENGINEER JUNE 19, 1934

S-2116

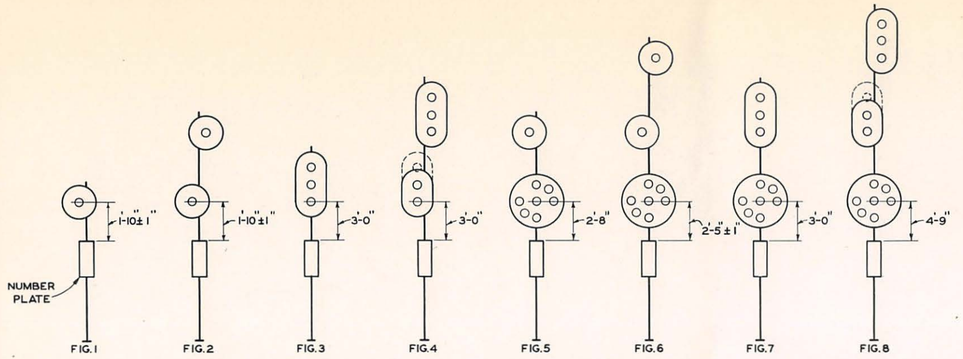

FIG. 1 FIG. 2 FIG. 3 FIG. 4 FIG. 5 FIG. 6 FIG. 7 FIG. 8

LOCATION OF VERTICAL NUMBER PLATES ON SIGNALS

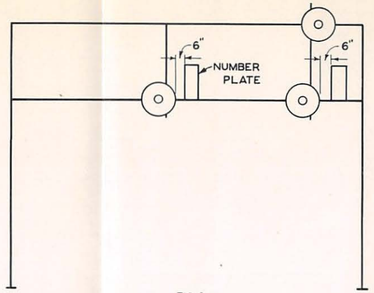

FIG. 9

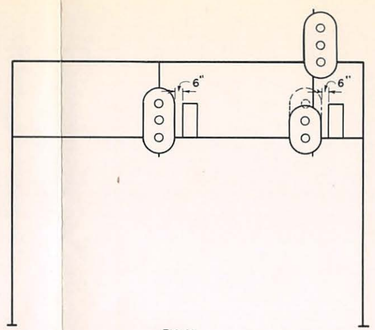

FIG. 10

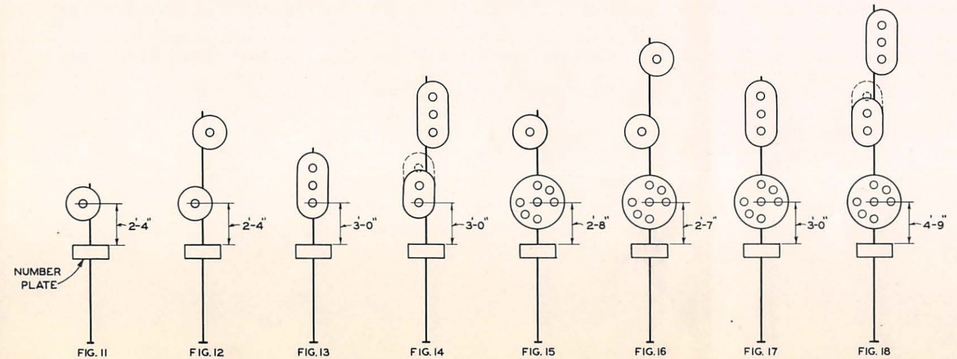

FIG. 11 FIG. 12 FIG. 13 FIG. 14 FIG. 15 FIG. 16 FIG. 17 FIG. 18

LOCATION OF HORIZONTAL NUMBER PLATES ON SIGNALS

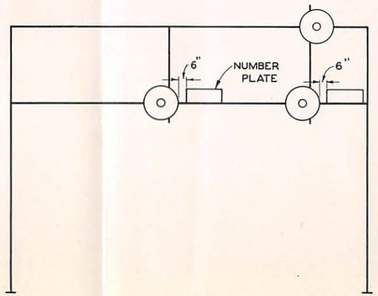

FIG. 19

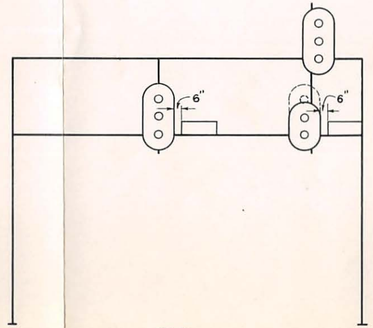

FIG. 20

NOTES

1. NUMBER PLATES AND RACKS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD DRAWING S-2115, STANDARD NUMBER PLATES AND RACKS FOR AUTOMATIC SIGNALS.
2. GRADE MARKERS IN ACCORDANCE WITH LATEST REVISION OF STANDARD DRAWING S-2110, STANDARD MARKER FOR GRADE SIGNALS, SHALL BE MOUNTED ON SIGNALS AS REQUIRED.

NO SCALE

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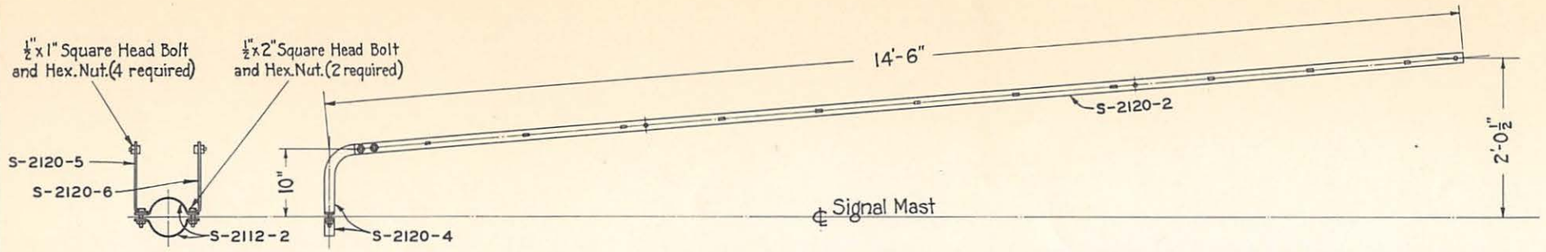
PERE MARQUETTE RAILWAY COMPANY

STANDARD

LOCATION OF NUMBER PLATES ON SIGNALS

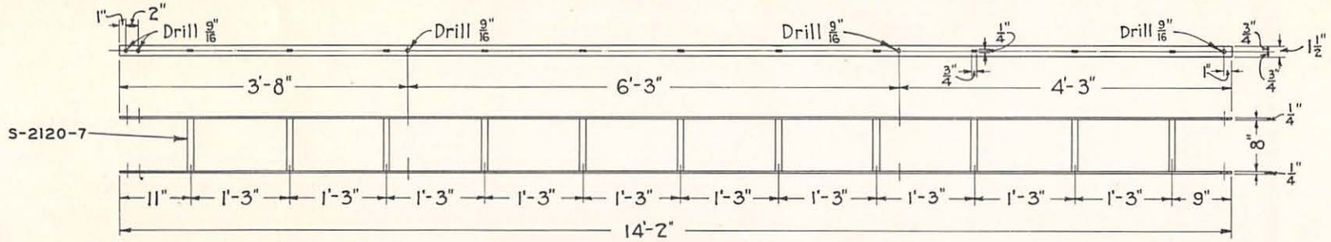
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: APRIL 21, 1936.
CHIEF ENGINEER

S-2118



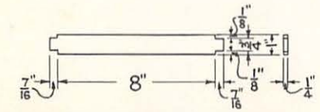
S-2120-4 TOP STAY COMPLETE

S-2120-1 LADDER - ONE UNIT HEIGHT SIGNAL



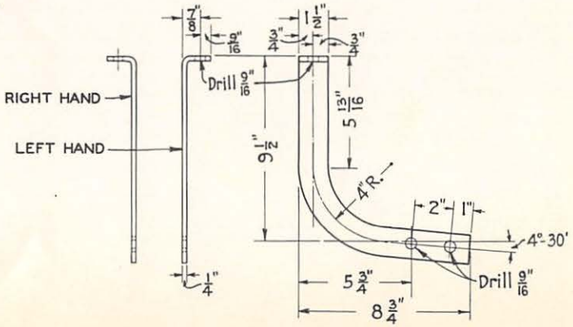
S-2120-2 LADDER ONLY

OPEN-HEARTH STEEL
SCALE ①



S-2120-7 LADDER RUNG

DEAD SOFT OPEN-HEARTH STEEL
SCALE ③



S-2120-5 LADDER TOP STAY RIGHT HAND
S-2120-6 " " " LEFT HAND

OPEN-HEARTH STEEL
SCALE ③

THE FOLLOWING REFERENCE IS FOR LADDER COMPLETE AND INCLUDES PARTS SHOWN IN TABLE.

S-2120-24 LADDER COMPLETE FOR ONE UNIT SIGNAL

1	S-2120-1	LADDER, ONE UNIT HEIGHT SIGNAL
1	S-2120-9	LADDER PLATFORM
1	S-2120-12	LADDER STAY, COMPLETE

LADDER FOUNDATION, S-2120-11 NOT INCLUDED IN ABOVE.

NOTE

LADDER, INCLUDING ALL PARTS, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES

① 0 3 6 9 12 15 18 21 24 27 30 33 36
② 0 1 2 3 4 5 6 7 8
③ 0 1 2 3 4 5 6 7 8 9 10 11 12

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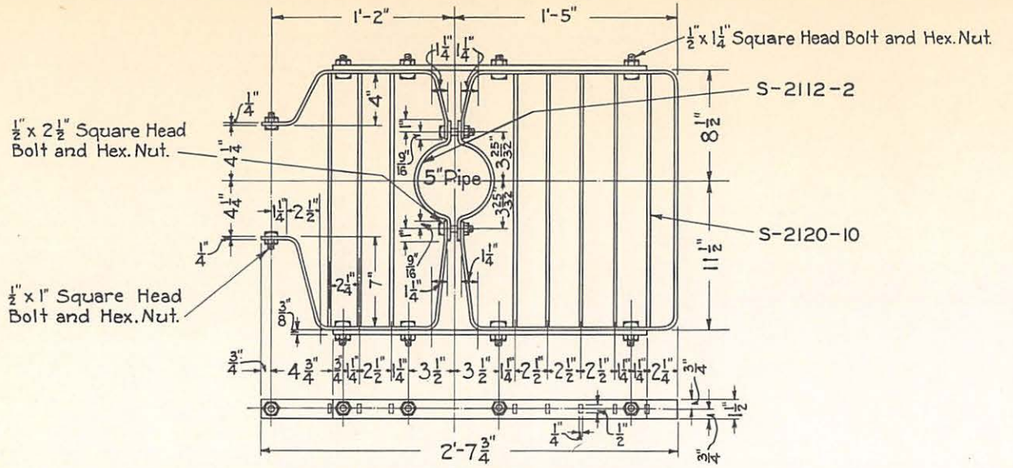
STANDARD LADDER FOR COLOR LIGHT GROUND SIGNAL

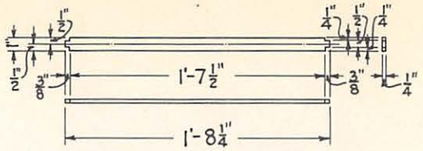
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: APRIL 21, 1931
CHIEF ENGINEER

SHEET 1 OF 5
S-2120



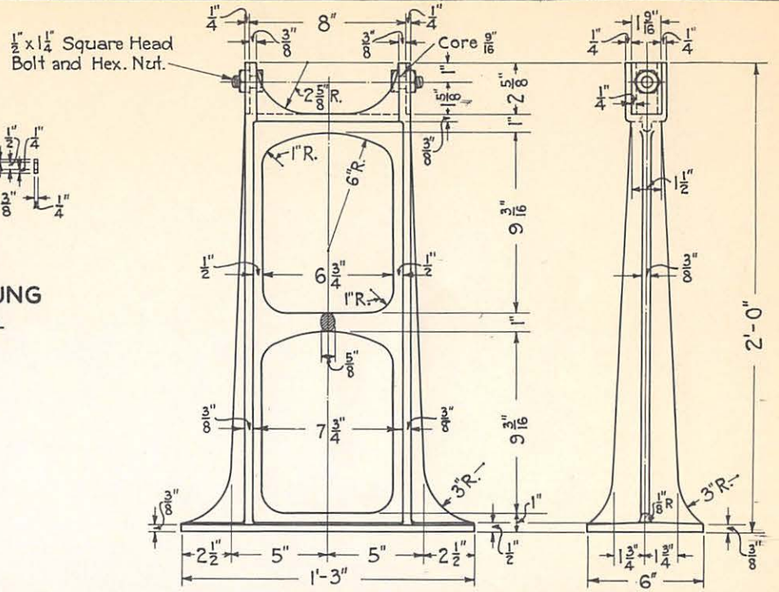
S-2120-9 LADDER PLATFORM

OPEN-HEARTH STEEL
FOR TOP UNIT
SCALE ②



S-2120-10 PLATFORM RUNG

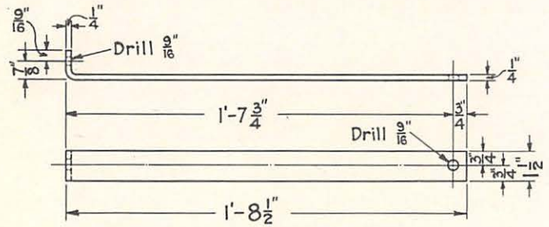
DEAD SOFT OPEN-HEARTH STEEL
SCALE ②



S-2120-11 LADDER FOUNDATION

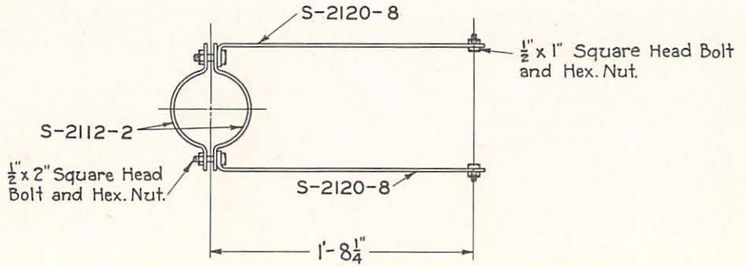
CAST IRON
SCALE ①

SCALE IN INCHES
① 0 1 2 3 4 5 6 7 8 9 10 11 12
② 0 3 6 9 12 15 18



S-2120-8 LADDER STAY

OPEN-HEARTH STEEL
SCALE ①



S-2120-12 LADDER STAY COMPLETE

SCALE ②

NOTES

ALL HOLES SHALL BE DRILLED 9/16" UNLESS OTHERWISE SHOWN.

LADDER, INCLUDING ALL PARTS, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

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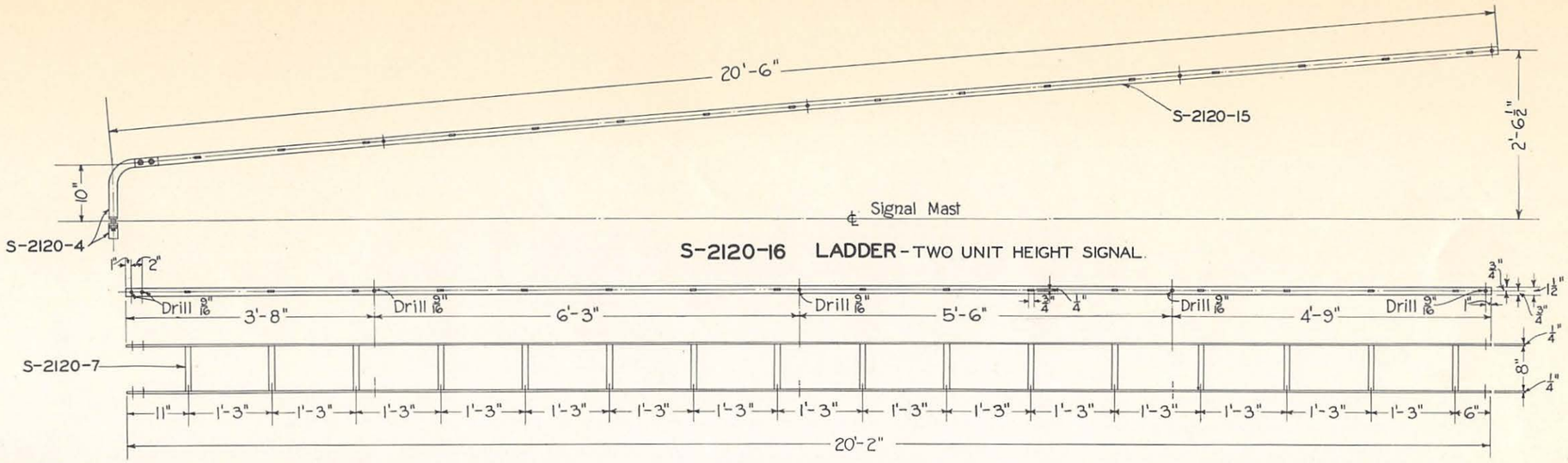
STANDARD LADDER FOR COLOR LIGHT GROUND SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: APRIL 21, 1931
CHIEF ENGINEER

SHEET 2 OF 5
S-2120

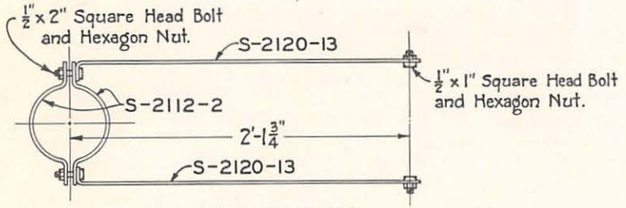


S-2120-16 LADDER - TWO UNIT HEIGHT SIGNAL.

S-2120-15 LADDER ONLY

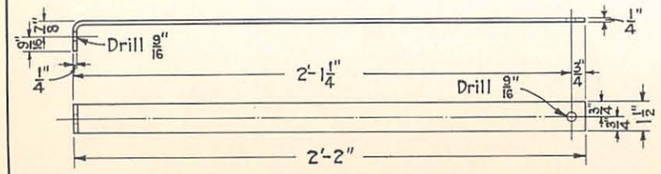
OPEN-HEARTH STEEL

SCALE ①



S-2120-14 LADDER STAY COMPLETE

SCALE ②



S-2120-13 LADDER STAY

OPEN-HEARTH STEEL

SCALE ③

SCALE IN INCHES

① 0 3 6 9 12 15 18 21 24 27 30 33 36

② 0 3 6 9 12 15 18

③ 0 1 2 3 4 5 6 7 8 9 10 11 12

THE FOLLOWING REFERENCE IS FOR LADDER COMPLETE AND INCLUDES PARTS SHOWN IN TABLE.

S-2120-25 LADDER COMPLETE FOR TWO UNIT HEIGHT SIGNAL

1	S-2120-16	LADDER, TWO UNIT HEIGHT SIGNAL
1	S-2120-9	LADDER PLATFORM, TOP UNIT
1	S-2120-21	LADDER PLATFORM, BOTTOM UNIT
1	S-2120-14	LADDER STAY, COMPLETE

LADDER FOUNDATION, S-2120-11 NOT INCLUDED IN ABOVE.

NOTE

LADDER, INCLUDING ALL PARTS, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

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C.S.L.		

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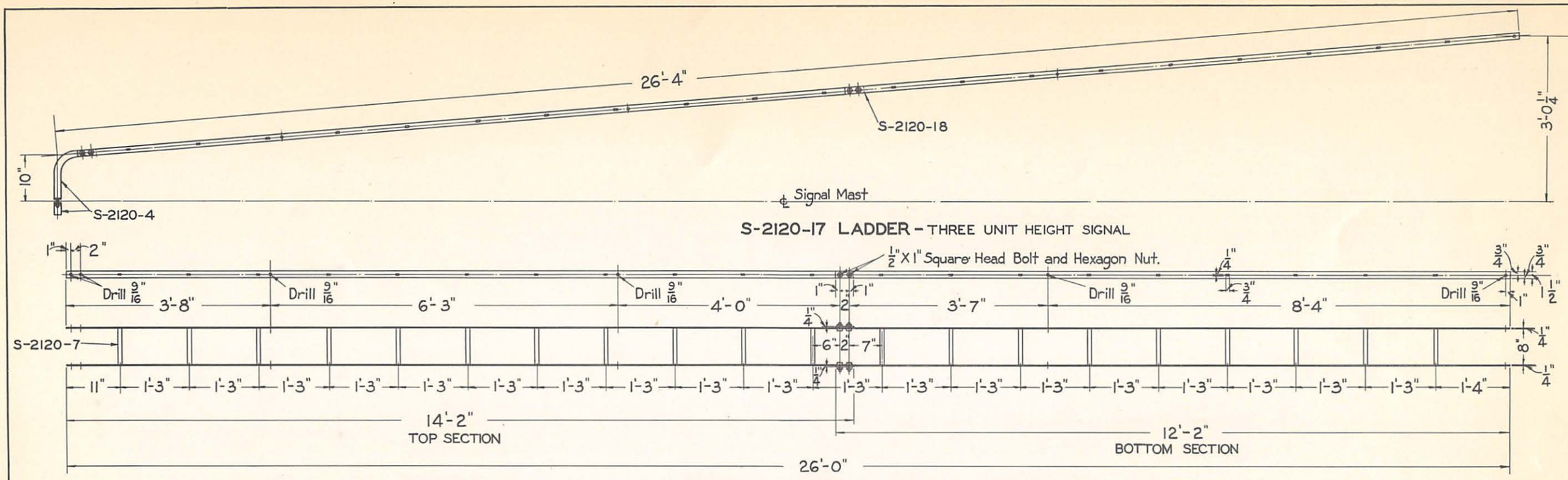
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD LADDER FOR COLOR LIGHT GROUND SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: C Muchel, CHIEF ENGINEER — APRIL 21, 1931

SHEET 3 OF 5

S-2120



S-2120-18 LADDER TOP AND BOTTOM SECTION WITH 4 SPLICING BOLTS
S-2120-19 LADDER TOP SECTION WITH 4 SPLICING BOLTS
S-2120-20 LADDER BOTTOM SECTION WITH 4 SPLICING BOLTS
OPEN-HEARTH STEEL

SCALE IN FEET
0 1 2 3

THE FOLLOWING REFERENCES ARE FOR LADDERS COMPLETE AND INCLUDE PARTS SHOWN IN TABLES.

S-2120-26 LADDER COMPLETE FOR THREE UNIT SIGNAL

1	S-2120-17	LADDER, THREE UNIT HEIGHT SIGNAL
1	S-2120-9	LADDER PLATFORM, TOP UNIT
1	S-2120-21	LADDER PLATFORM, MIDDLE UNIT
1	S-2120-22	LADDER PLATFORM, BOTTOM UNIT

S-2120-27 LADDER COMPLETE FOR TWO UNIT SIGNAL, THREE UNIT HEIGHT

1	S-2120-17	LADDER, THREE UNIT. HEIGHT SIGNAL
1	S-2120-9	LADDER PLATFORM, TOP UNIT
1	S-2120-12	LADDER STAY, COMPLETE
1	S-2120-22	LADDER PLATFORM, BOTTOM UNIT

NOTE
LADDER FOUNDATION, S-2120-11 NOT INCLUDED IN ABOVE.

NOTES
ALL HOLES SHALL BE DRILLED 9/16" UNLESS OTHERWISE SHOWN.
LADDER, INCLUDING ALL PARTS, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

APPROVED FOR USE
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT
ERIE RAILROAD COMPANY — VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT
C-H-W | C-H-W | C.D.M. | A.J.P.

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THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
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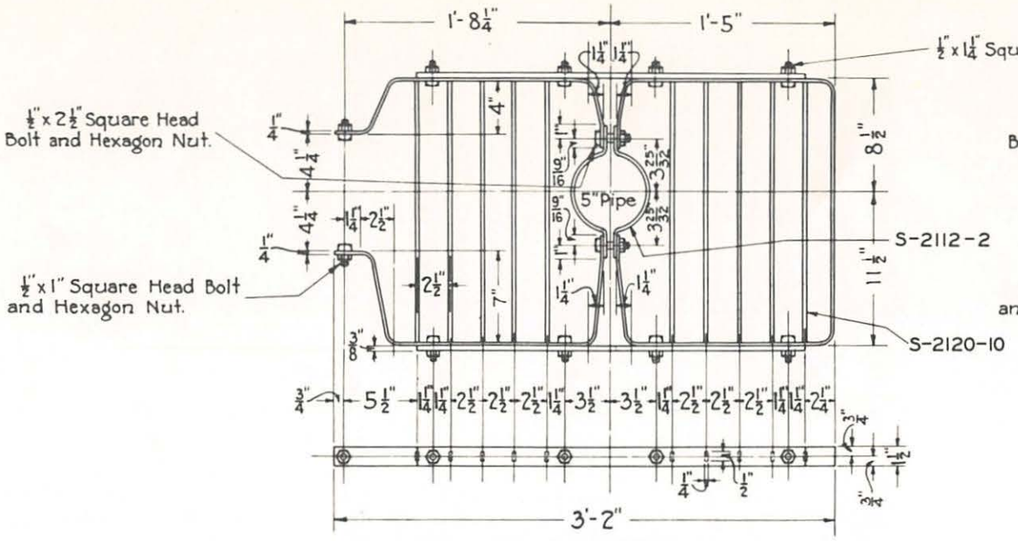
STANDARD LADDER FOR COLOR LIGHT GROUND SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: CHIEF ENGINEER APRIL 21, 1931

SHEET 4 OF 5
S-2120

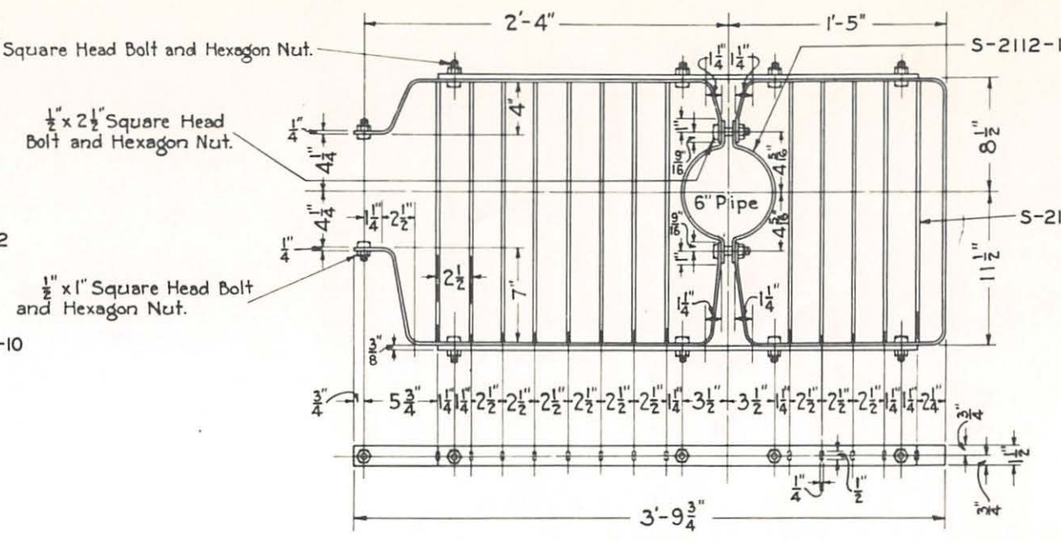


S-2120-21 LADDER PLATFORM

OPEN-HEARTH STEEL

FOR BOTTOM UNIT ON TWO UNIT MAST AND MIDDLE UNIT ON THREE UNIT MAST

SCALE ①



S-2120-22 LADDER PLATFORM

OPEN-HEARTH STEEL

FOR BOTTOM UNIT ON THREE UNIT MAST

SCALE ①

SCALE IN INCHES

① 0 3 6 9 12 15 18

② 0 1 2 3 4 5 6 7 8

NOTES

ALL HOLES SHALL BE DRILLED 9/16" UNLESS OTHERWISE SHOWN.

LADDER, INCLUDING ALL PARTS, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

APPROVED FOR USE

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ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

CHW	C.D.M.	A.J.P.
C.B.P.		

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PERE MARQUETTE RAILWAY COMPANY

STANDARD LADDER FOR COLOR LIGHT GROUND SIGNAL

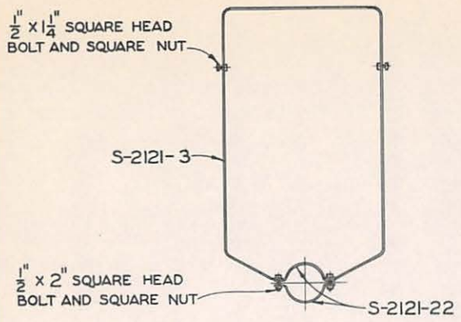
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: CHIEF ENGINEER

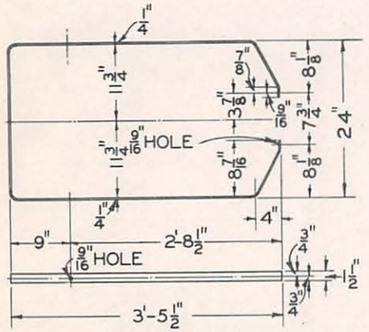
APRIL 21, 1931

SHEET 5 OF 5

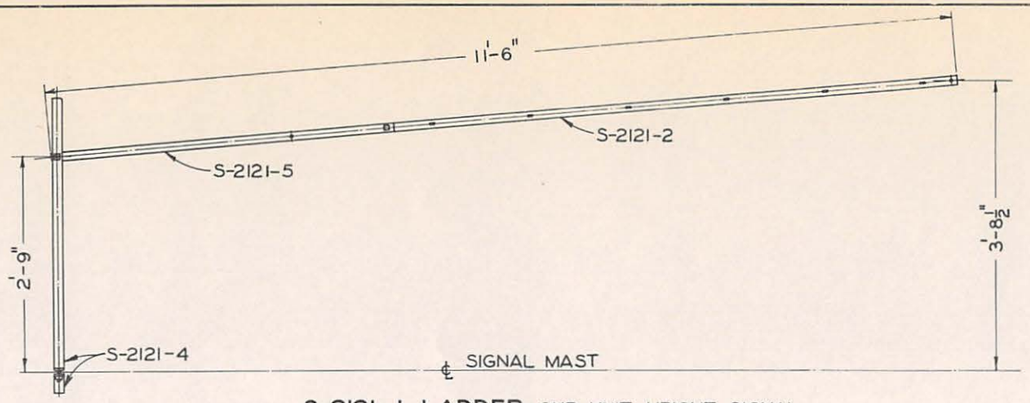
S-2120



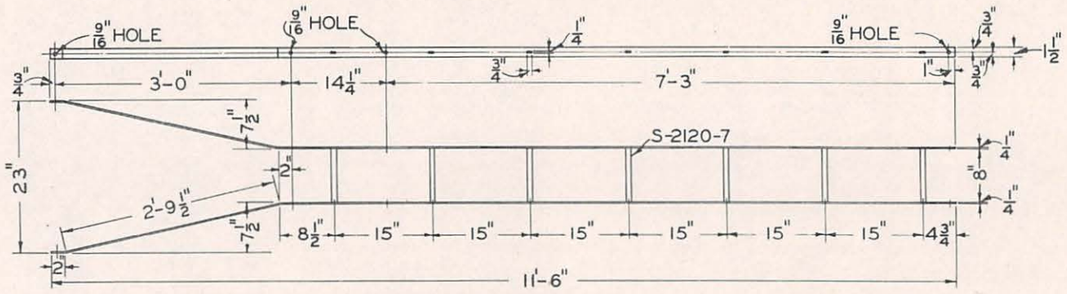
S-2121-4 TOP HANDRAIL COMPLETE



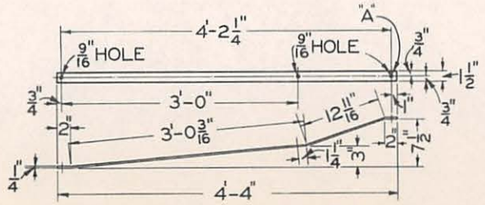
S-2121-3 TOP HANDRAIL
OPEN-HEARTH STEEL



S-2121-1 LADDER-ONE UNIT HEIGHT SIGNAL



S-2121-2 LADDER ONLY
OPEN-HEARTH STEEL



S-2121-5 BRACE WITH 1/2"x1" SQUARE HEAD BOLT AND SQUARE NUT FOR HOLE "A"
OPEN-HEARTH STEEL

THE FOLLOWING REFERENCE IS FOR LADDER COMPLETE AND INCLUDES PARTS SHOWN IN TABLE.

S-2121-6 LADDER COMPLETE FOR ONE UNIT SIGNAL

1	S-2121-1	LADDER, ONE UNIT HEIGHT SIGNAL
1	S-2121-18	LADDER PLATFORM

LADDER FOUNDATION S-2120-11 NOT INCLUDED IN ABOVE

NOTE

LADDER, INCLUDING ALL PARTS, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
0 6 12 24 36

APPROVED FOR USE

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ERIE RAILROAD COMPANY
R Bellwoodruff VICE PRESIDENT

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C.H.W.		

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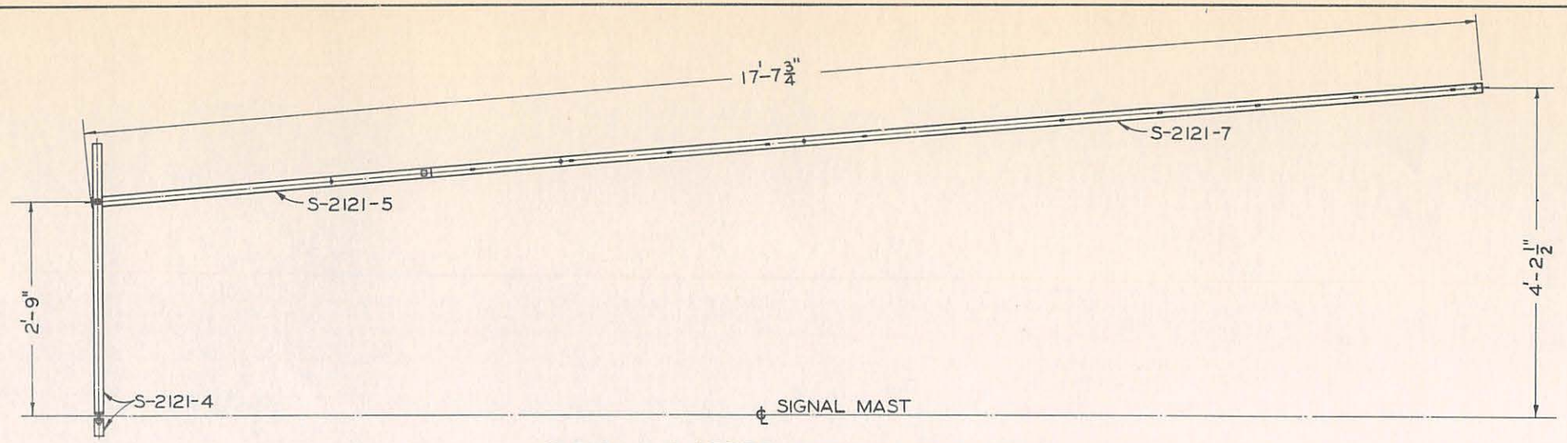
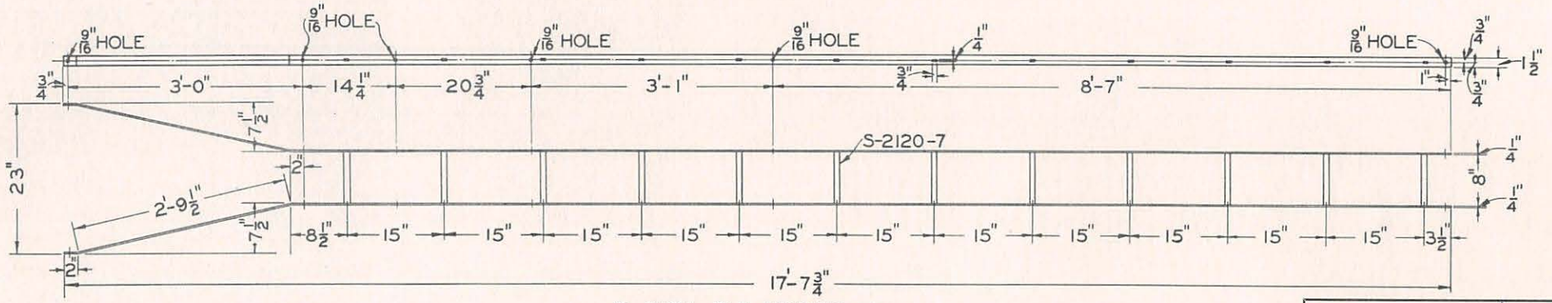
STANDARD LADDER FOR COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: A Mitchell CHIEF ENGINEER JUNE 27, 1933

SHEET 1 OF 5
S-2121



S-2121-8 LADDER - TWO UNIT HEIGHT SIGNAL

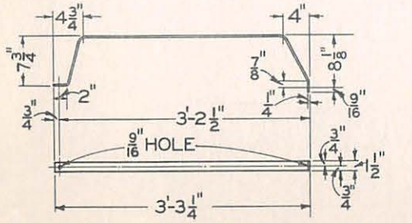


S-2121-7 LADDER ONLY
OPEN-HEARTH STEEL

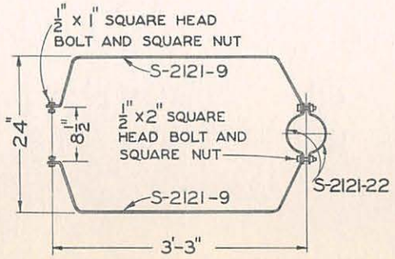
NOTE

LADDER, INCLUDING ALL PARTS, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
0 6 12 24 36



S-2121-9 LADDER HANDRAIL SIDE
OPEN-HEARTH STEEL



S-2121-10 LADDER HANDRAIL COMPLETE
FOR BOTTOM UNIT ON TWO UNIT MAST
AND MIDDLE UNIT ON THREE UNIT MAST

THE FOLLOWING REFERENCE IS FOR LADDER COMPLETE AND INCLUDES PARTS SHOWN IN TABLE.

S-2121-11 LADDER COMPLETE FOR TWO UNIT HEIGHT SIGNAL

1	S-2121-8	LADDER, TWO UNIT HEIGHT SIGNAL
1	S-2121-18	LADDER PLATFORM, TOP UNIT
1	S-2121-19	LADDER PLATFORM, BOTTOM UNIT
1	S-2121-10	LADDER HANDRAIL, COMPLETE, BOTTOM UNIT

LADDER FOUNDATION, S-2120-11 NOT INCLUDED IN ABOVE

APPROVED FOR USE

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ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

C.H.W.	C.D.M.	A.J.P.
C.H.W.		

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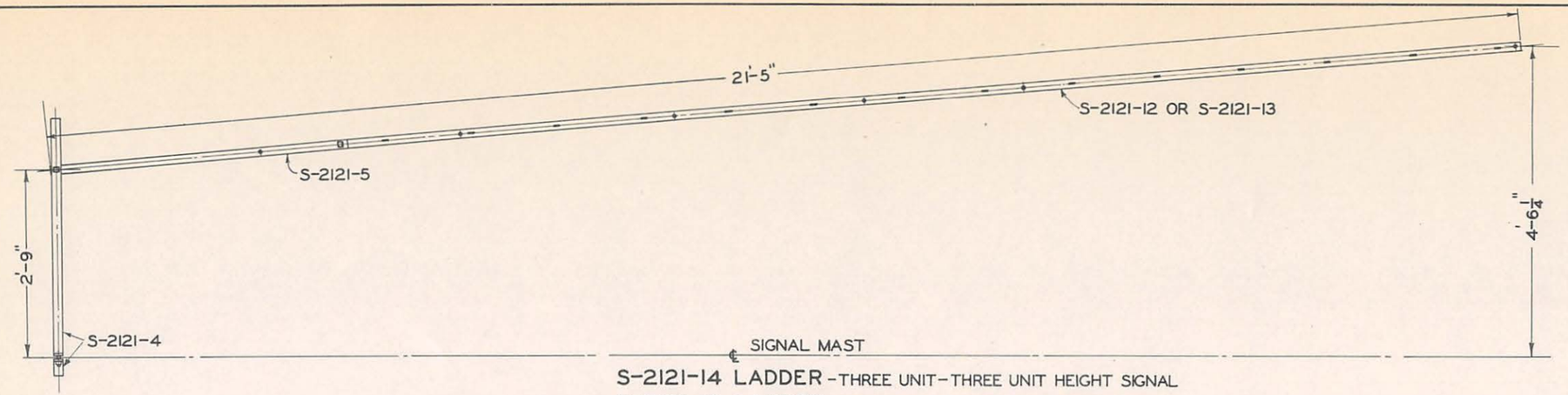
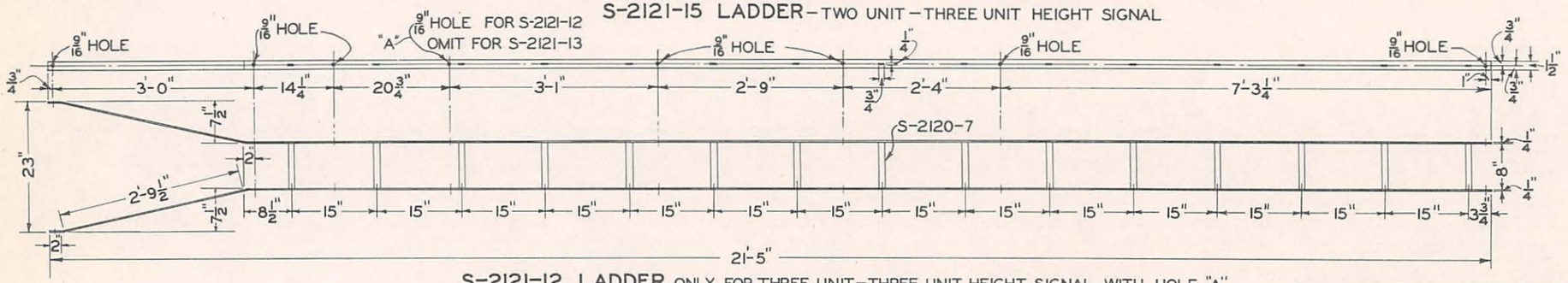
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD LADDER FOR COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 27, 1933
CHIEF ENGINEER



S-2121-14 LADDER - THREE UNIT - THREE UNIT HEIGHT SIGNAL
S-2121-15 LADDER - TWO UNIT - THREE UNIT HEIGHT SIGNAL



S-2121-12 LADDER ONLY FOR THREE UNIT - THREE UNIT HEIGHT SIGNAL WITH HOLE "A"
S-2121-13 LADDER ONLY FOR TWO UNIT - THREE UNIT HEIGHT SIGNAL WITHOUT HOLE "A"
OPEN-HEARTH STEEL

THE FOLLOWING REFERENCES ARE FOR LADDERS COMPLETE AND INCLUDE PARTS SHOWN IN TABLES

S-2121-16 LADDER COMPLETE FOR TWO UNIT-THREE UNIT HEIGHT SIGNAL

1	S-2121-15	LADDER, TWO UNIT-THREE UNIT HEIGHT
1	S-2121-18	LADDER PLATFORM, TOP UNIT
1	S-2121-20	LADDER PLATFORM, BOTTOM UNIT
1	S-2121-24	LADDER HANDRAIL, COMPLETE, BOTTOM UNIT
1	S-2121-26	LADDER STAY, COMPLETE

S-2121-17 LADDER COMPLETE FOR THREE UNIT-THREE UNIT HEIGHT SIGNAL

1	S-2121-14	LADDER, THREE UNIT-THREE UNIT HEIGHT
1	S-2121-18	LADDER PLATFORM, TOP UNIT
1	S-2121-19	LADDER PLATFORM, MIDDLE UNIT
1	S-2121-20	LADDER PLATFORM, BOTTOM UNIT
1	S-2121-10	LADDER HANDRAIL, COMPLETE, MIDDLE UNIT
1	S-2121-24	LADDER HANDRAIL, COMPLETE, BOTTOM UNIT

LADDER FOUNDATION S-2120-11 NOT INCLUDED IN ABOVE

NOTE
LADDER, INCLUDING ALL PARTS, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
0 6 12 24 36

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Woodruff VICE PRESIDENT

ERIE RAILROAD COMPANY
R E Woodruff VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Woodruff VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
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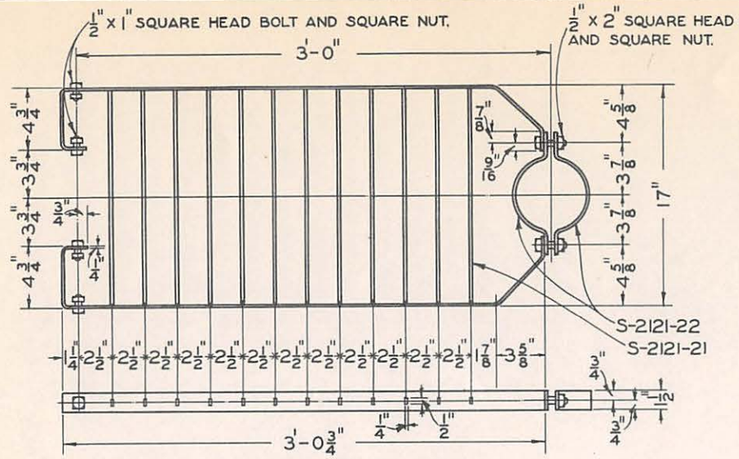
STANDARD LADDER FOR COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: A Newell CHIEF ENGINEER JUNE 27, 1933

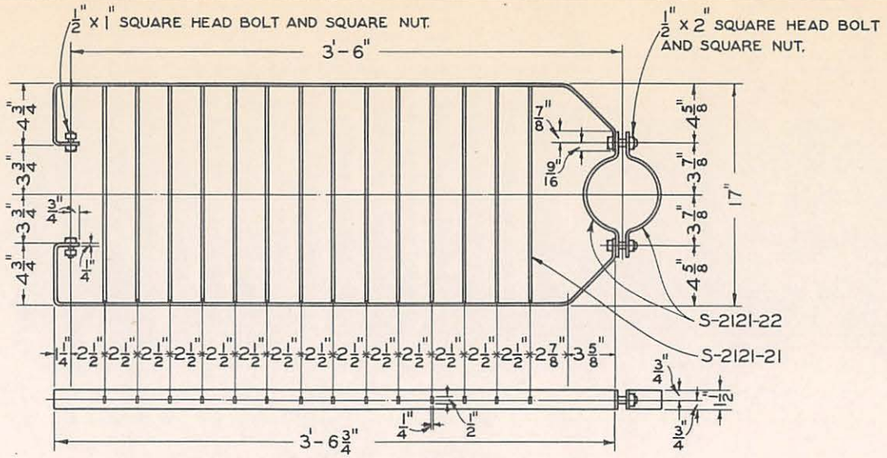
SHEET 3 OF 5
S-2121



S-2121-18 LADDER PLATFORM

OPEN-HEARTH STEEL

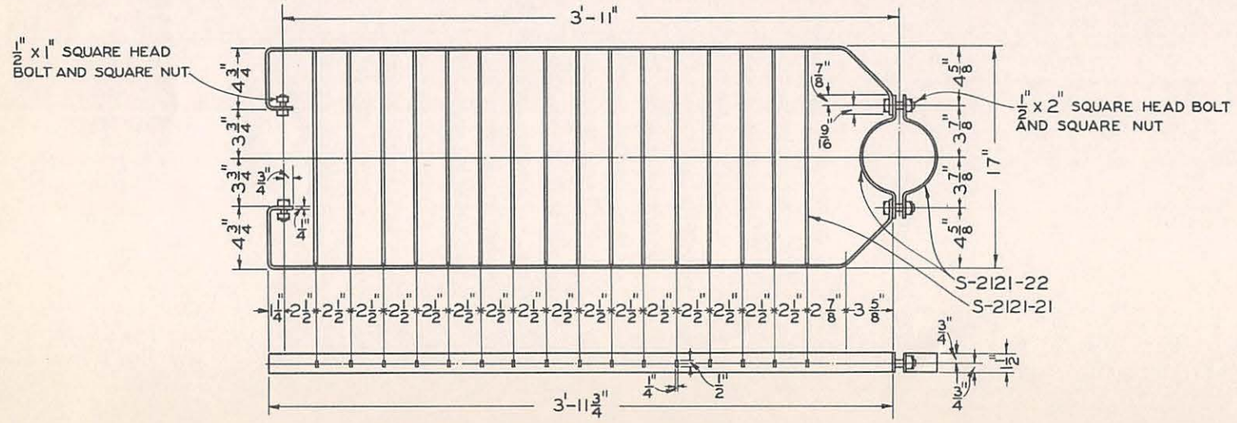
FOR TOP UNIT ON ONE, TWO, AND THREE UNIT MAST



S-2121-19 LADDER PLATFORM

OPEN-HEARTH STEEL

FOR BOTTOM UNIT ON TWO UNIT MAST AND MIDDLE UNIT ON THREE UNIT MAST



S-2121-20 LADDER PLATFORM

OPEN-HEARTH STEEL

FOR BOTTOM UNIT ON THREE UNIT MAST

NOTES

1. ALL HOLES SHALL BE 9/16" UNLESS OTHERWISE SHOWN.
2. LADDER, INCLUDING ALL PARTS, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES

0 3 6 9 12 15 18

APPROVED FOR USE

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ERIE RAILROAD COMPANY — R E Woodruff, VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D Brooke, VICE PRESIDENT

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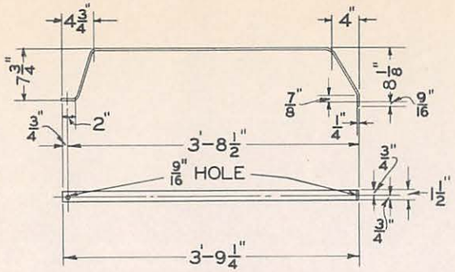
STANDARD LADDER FOR COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

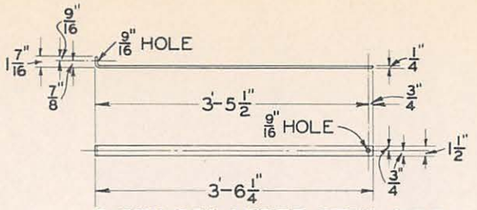
APPROVED: C Churchill, CHIEF ENGINEER — JUNE 27, 1933

SHEET 4 OF 5

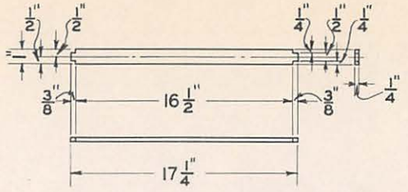
S-2121



S-2121-23 LADDER HANDRAIL SIDE
OPEN-HEARTH STEEL
SCALE ①

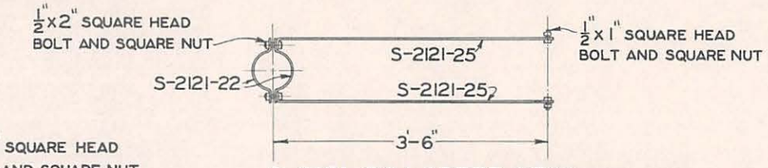


S-2121-25 LADDER STAY SIDE
OPEN-HEARTH STEEL
SCALE ①

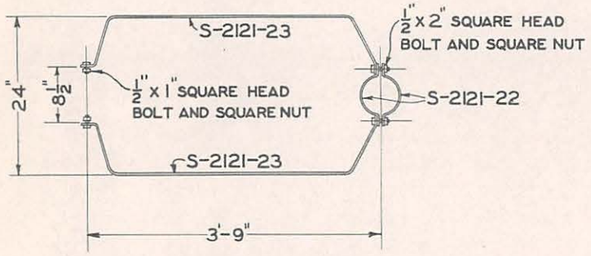


S-2121-21 PLATFORM RUNG
DEAD SOFT OPEN-HEARTH STEEL
SCALE ②

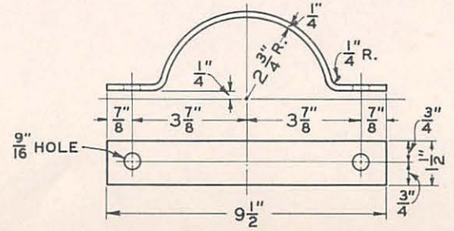
NOTE
LADDER PARTS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



S-2121-26 LADDER STAY COMPLETE
FOR TWO UNIT – THREE UNIT HEIGHT MAST
SCALE ①



S-2121-24 LADDER HANDRAIL COMPLETE
FOR BOTTOM UNIT ON
THREE UNIT HEIGHT MAST
SCALE ①



S-2121-22 ONE HALF CLAMP
FOR 5 INCH PIPE
OPEN-HEARTH STEEL
SCALE ③

SCALE IN INCHES
① 0 6 12 24 36
② 0 3 6 9 12 15 18
③ 0 1 2 3 4 5 6 7 8

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VICE PRESIDENT

ERIE RAILROAD COMPANY
H Woodcuff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Booth
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
B Bowman
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C.H.W. | K.L.M. | C.D.M. | A.J.P.

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ERIE RAILROAD COMPANY
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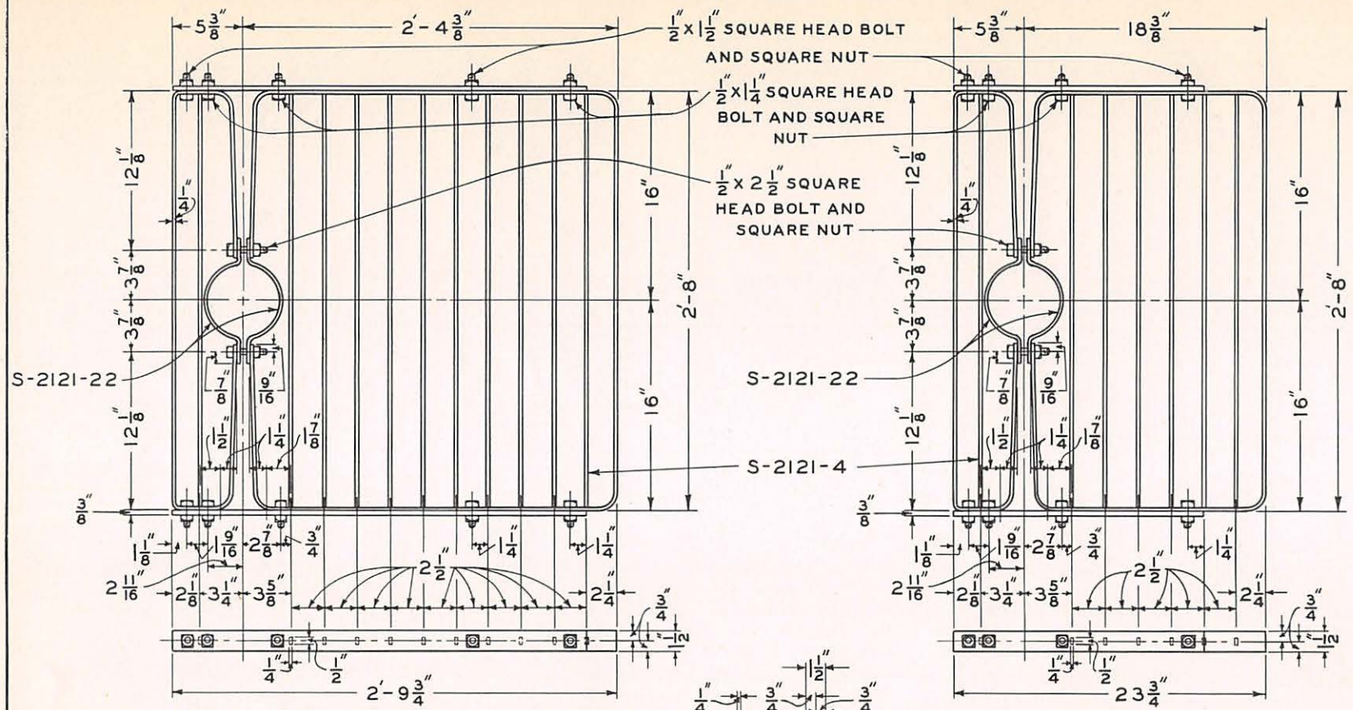
STANDARD LADDER FOR COLOR LIGHT SEARCHLIGHT GROUND SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: C Churchill JUNE 27, 1933
CHIEF ENGINEER

SHEET 5 OF 5
S-2121



S-2122-1 BRIDGE SIGNAL PLATFORM

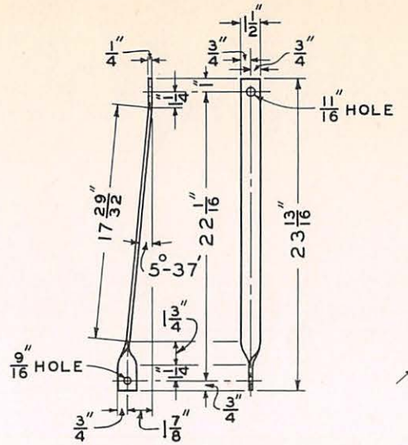
FOR LOWER UNIT SEARCHLIGHT OR VERTICAL TYPE SIGNAL

OPEN-HEARTH STEEL

S-2122-2 BRIDGE SIGNAL PLATFORM

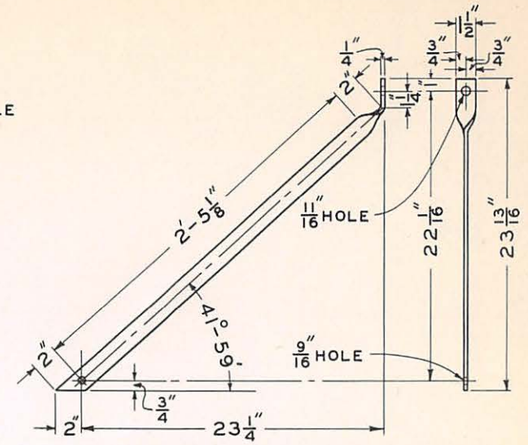
FOR TOP UNIT ON TWO UNIT OR MIDDLE UNIT ON THREE UNIT VERTICAL TYPE SIGNAL

OPEN-HEARTH STEEL



S-2122-5 PLATFORM STAY

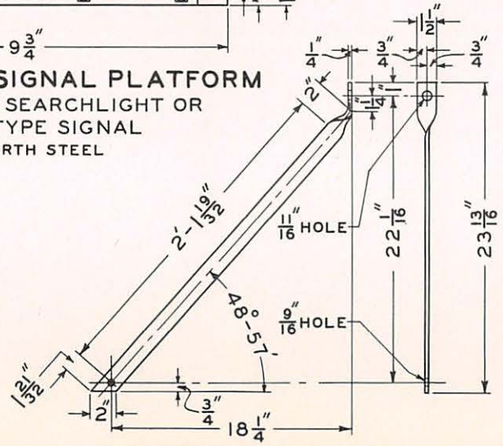
OPEN-HEARTH STEEL



S-2122-6 PLATFORM STAY

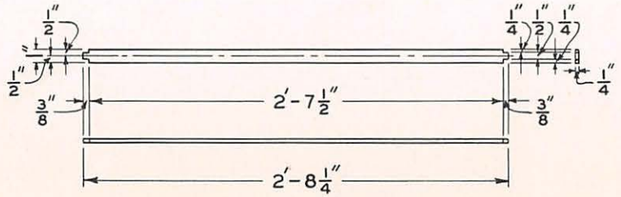
OPEN-HEARTH STEEL

NOTE: PLATFORM AND STAYS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



S-2122-3 PLATFORM STAY

OPEN-HEARTH STEEL



S-2122-4 PLATFORM RUNG

DEAD SOFT OPEN-HEARTH STEEL

SCALE IN INCHES
0 3 6 9 12 15 18

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
PRESIDENT

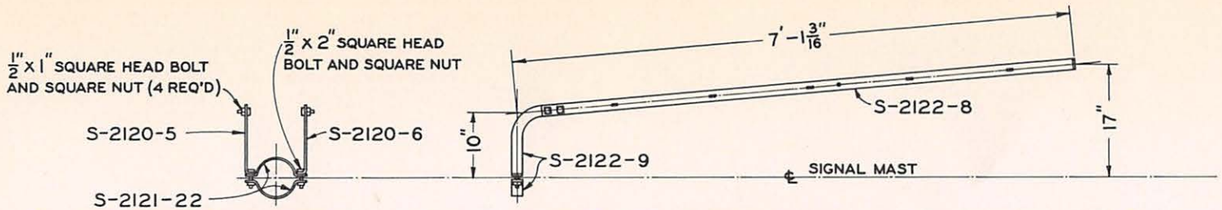
C. H. W. K. L. M.	W. S. E.	W. N. H.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD LADDER AND PLATFORM FOR COLOR LIGHT BRIDGE SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
DEC. 7, 1942
CHAIRMAN

SHEET 1 OF 4
S-2122-A



S-2122-9 TOP STAY COMPLETE
SCALE (2)

S-2122-7 LADDER – THREE UNIT HEIGHT SEARCHLIGHT TYPE BRIDGE SIGNAL
SCALE (2)

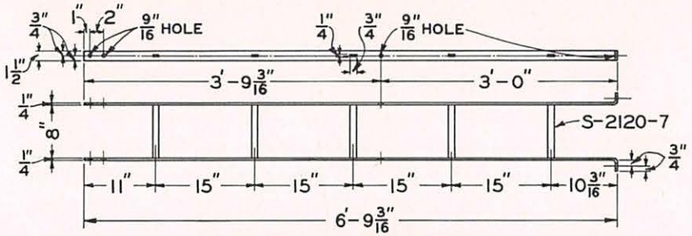
THE FOLLOWING REFERENCE IS FOR LADDER COMPLETE AND INCLUDES PARTS SHOWN IN TABLE

S-2122-13 LADDER COMPLETE FOR THREE UNIT HEIGHT SEARCHLIGHT TYPE BRIDGE SIGNAL.

1	S-2122-7	LADDER, THREE UNIT HEIGHT SIGNAL
1	S-2122-14	LADDER PLATFORM
2	S-2122-16	PLATFORM STAYS
2	———	1/2" X 2" LAG SCREWS, GALVANIZED

NOTE

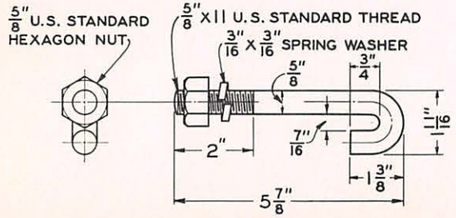
LADDER, INCLUDING ALL PARTS, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



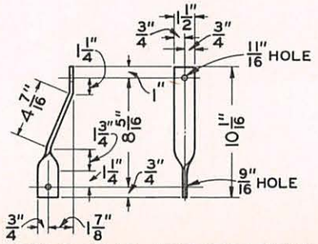
S-2122-8 LADDER ONLY
OPEN-HEARTH STEEL
SCALE (2)

SCALE IN INCHES

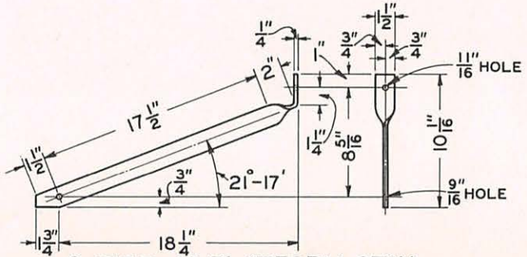
① 0 3 6 9 12 15 18
② 0 6 12 24 36
③ 0 1 2 3 4 5 6



S-2122-10 HOOK BOLT COMPLETE
OPEN-HEARTH STEEL
SCALE (3)



S-2122-11 PLATFORM STAY
OPEN-HEARTH STEEL
SCALE (1)



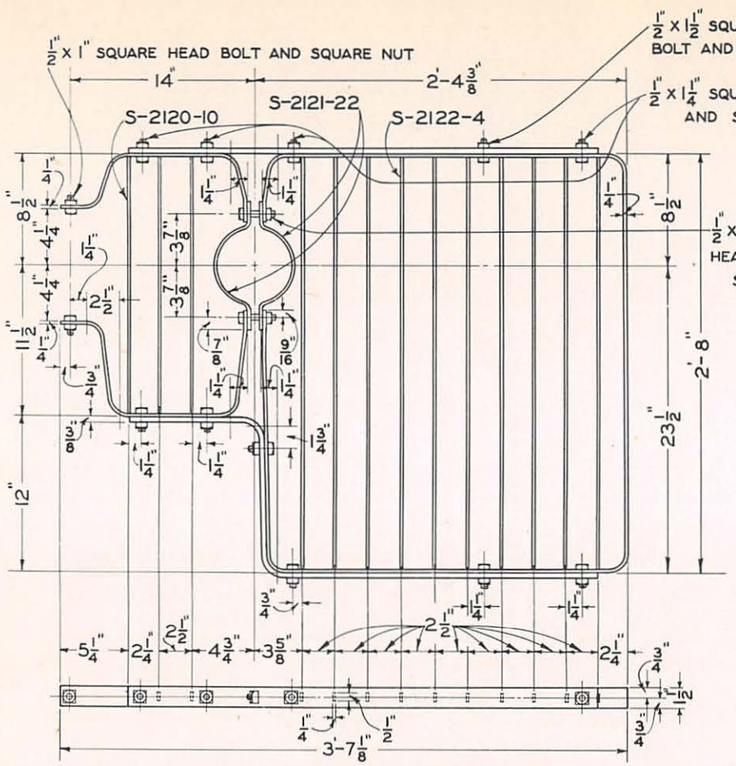
S-2122-12 PLATFORM STAY
OPEN-HEARTH STEEL
SCALE (1)

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY H.A. Cornmaster VICE PRESIDENT AND GENERAL MANAGER		
ERIE RAILROAD COMPANY W.W. Barber VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY J.M. Davis PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY A.J. Bowman PRESIDENT		
C.H.W. C.B.P.	W.S.E.	W.N.H.

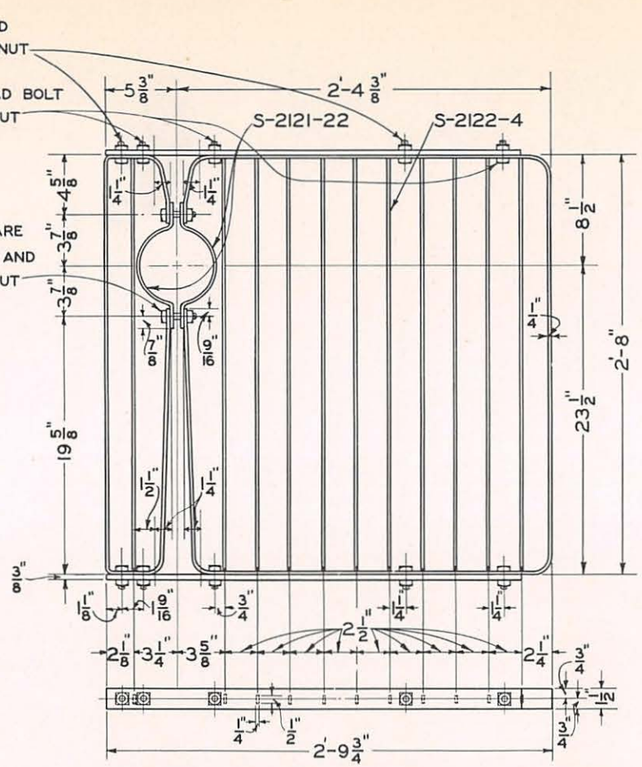
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD LADDER AND PLATFORM FOR COLOR LIGHT BRIDGE SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
DEC. 7, 1942
H.A. Wallace
CHAIRMAN

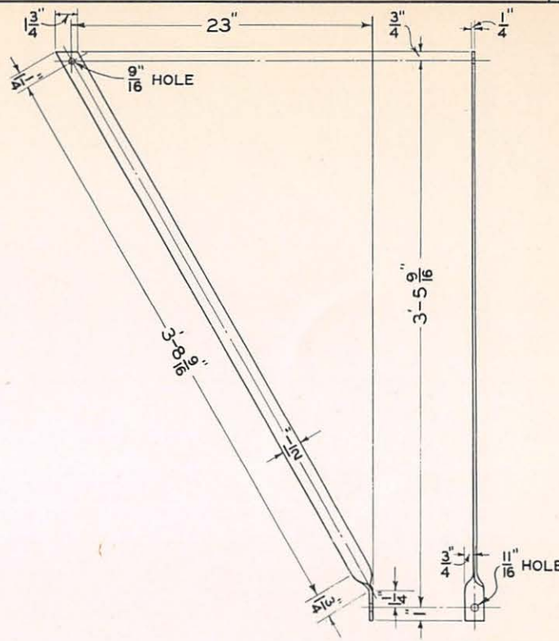


S-2122-14 LADDER PLATFORM
FOR TOP UNIT ON THREE UNIT SEARCH-LIGHT TYPE SIGNALS
OPEN-HEARTH STEEL



S-2122-15 BRIDGE SIGNAL PLATFORM
FOR TOP UNIT ON TWO UNIT OR MIDDLE UNIT ON THREE UNIT SEARCHLIGHT TYPE SIGNALS
OPEN-HEARTH STEEL

NOTE
PLATFORM AND STAYS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



S-2122-16 PLATFORM STAY
OPEN-HEARTH STEEL

SCALE IN INCHES
0 3 6 9 12 15 18

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H.H. Courmaster
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
T.H.D. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
S.M. Davis
PRESIDENT

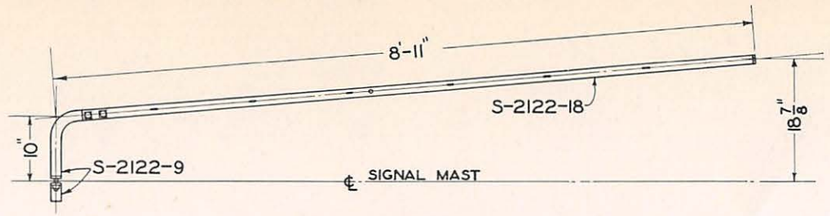
PERE MARQUETTE RAILWAY COMPANY
A.J. Bowman
PRESIDENT

C.H.W. | W.S.E. | W.N.H.
K.L.M.

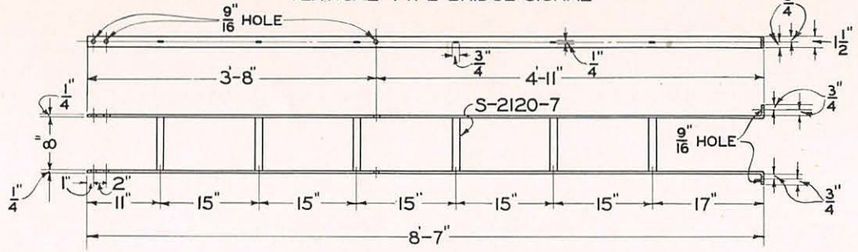
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD LADDER AND PLATFORM FOR COLOR LIGHT BRIDGE SIGNALS

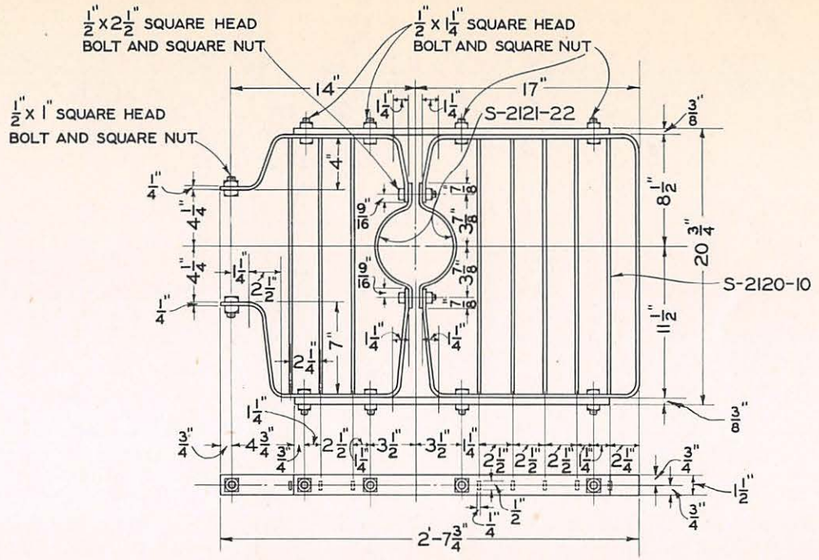
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. E. Wallace
CHAIRMAN
DEC. 7, 1942



S-2122-17 LADDER THREE UNIT HEIGHT
VERTICAL TYPE BRIDGE SIGNAL



S-2122-18 LADDER ONLY
OPEN-HEARTH STEEL
SCALE (1)



S-2122-19 LADDER PLATFORM
FOR TOP UNIT ON THREE UNIT VERTICAL TYPE BRIDGE SIGNAL
OPEN-HEARTH STEEL
SCALE (2)

THE FOLLOWING REFERENCE IS FOR LADDER COMPLETE AND INCLUDES PARTS SHOWN IN TABLE

S-2122-20 LADDER COMPLETE FOR THREE UNIT HEIGHT VERTICAL TYPE BRIDGE SIGNAL

1	S-2122-17	LADDER THREE UNIT HEIGHT SIGNAL
1	S-2122-19	LADDER PLATFORM
2	———	1/2" x 2" LAG SCREWS GALVANIZED

NOTE

LADDER AND PLATFORM SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
(1) 0 6 12 24 36
(2) 0 3 6 9 12 15 18

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H.A. Scarritt
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
W.H. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
W.H. Davis
PRESIDENT

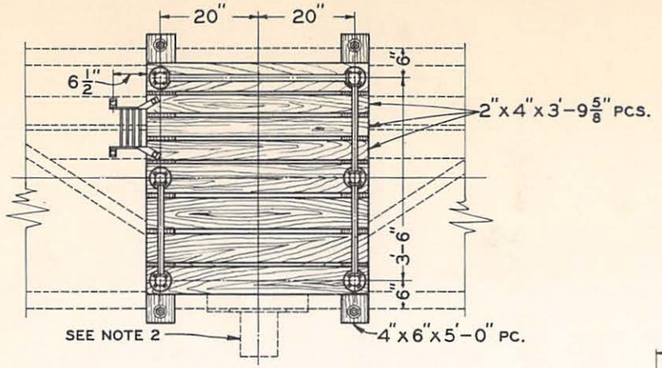
PERE MARQUETTE RAILWAY COMPANY
A.H. Browman
PRESIDENT

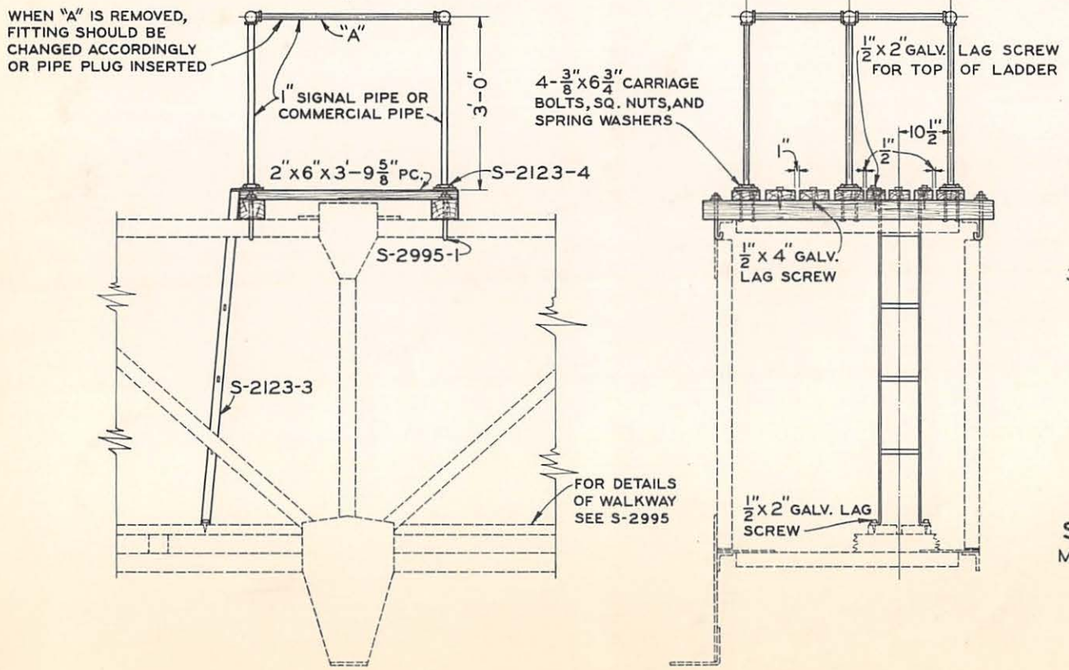
K. L. M. | W. S. E. | W. N. H.
K. L. M.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD LADDER AND PLATFORM FOR COLOR LIGHT BRIDGE SIGNALS

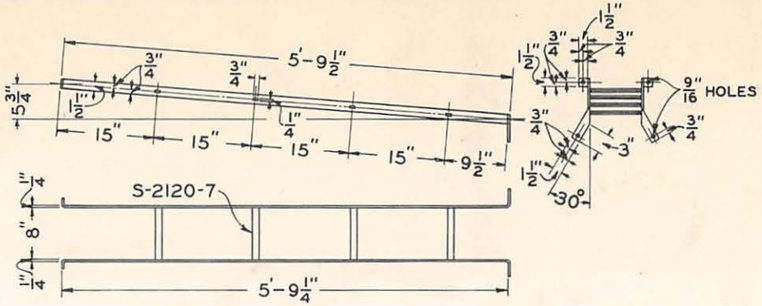
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
DEC. 7, 1942
J. Kevallace
CHAIRMAN



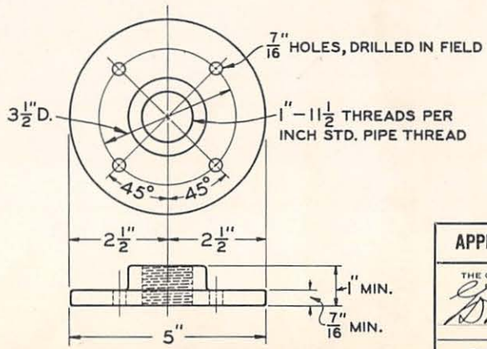


S-2123-1 HANDRAIL, PLATFORM, AND LADDER COMPLETE AS SHOWN
S-2123-2 " " " " COMPLETE EXCEPT WITHOUT BAR "A"

SCALE (2)



S-2123-3 LADDER ONLY
OPEN-HEARTH STEEL
SCALE (3)

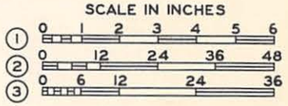


S-2123-4 FLOOR FLANGE
MAKE FROM COMMERCIAL FLANGE
CAST IRON
SCALE (1)

NOTES

1. HANDRAIL AND LADDER SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. APPLICATION OF HANDRAIL, PLATFORM, AND LADDER IS FOR TWO, THREE, AND FOUR TRACK SIGNAL BRIDGE, DRAWING S-2995.
3. PLATFORM SHALL BE MADE OF TREATED LUMBER. THE LUMBER SHALL BE AS SPECIFIED FOR GANG PLANK AND SCAFFOLD PLANK IN ACCORDANCE WITH LATEST REVISION OF STANDARD MATERIAL SPECIFICATIONS J-58, SPECIFICATIONS AND INSTRUCTIONS FOR ORDERING AND INSPECTING LUMBER AND TIMBER FOR RAILWAY USES.

SCALE IN INCHES



APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Boocke, VICE PRESIDENT
ERIE RAILROAD COMPANY — R.C. Woodruff, VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D Boocke, VICE PRESIDENT
PERE MARQUETTE RAILWAY COMPANY — R.H. Bowman, VICE PRESIDENT

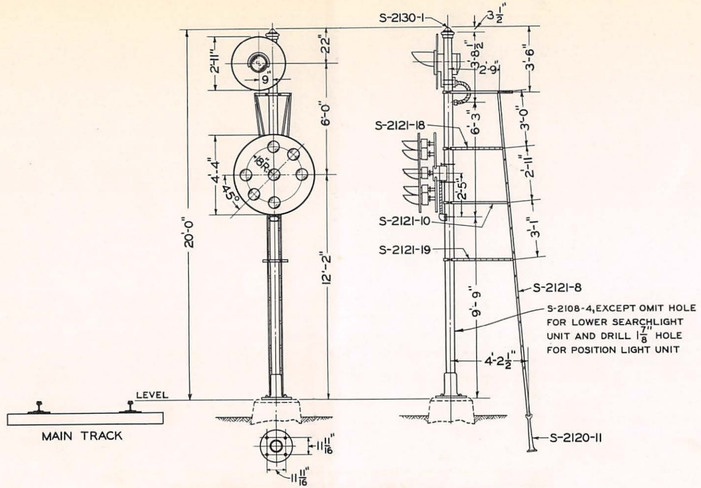
C. H. W.	C.D.M.	A. J. P.
C. B. P.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD HANDRAIL, LADDER, AND PLATFORM ARRANGEMENT FOR BRIDGE SIGNALS

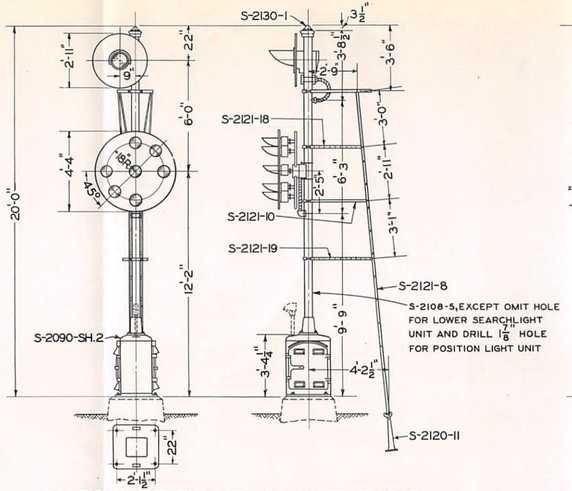
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: W Mitchell, CHIEF ENGINEER — FEB. 20, 1934.

S-2123



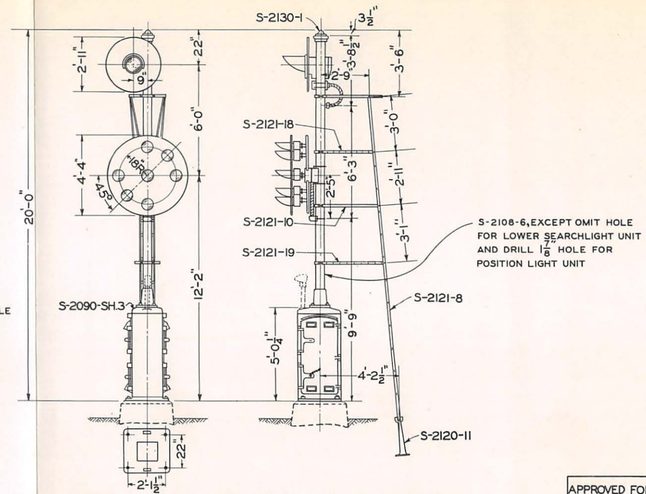
POSITION LIGHT TAKE SIDING AND TELEPHONE
TRAIN ORDER-SEARCHLIGHT GROUND SIGNAL

ONE SEARCHLIGHT UNIT AND ONE POSITION LIGHT UNIT	DESCRIPTION
S-2124-1	ONE SEARCHLIGHT UNIT AND ONE POSITION LIGHT UNIT GROUND SIGNAL FOR MOUNTING ON CONCRETE FOUNDATION, COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS.



POSITION LIGHT TAKE SIDING AND TELEPHONE
TRAIN ORDER-SEARCHLIGHT GROUND SIGNAL

ONE SEARCHLIGHT UNIT AND ONE POSITION LIGHT UNIT	DESCRIPTION
S-2124-2	ONE SEARCHLIGHT UNIT AND ONE POSITION LIGHT UNIT GROUND SIGNAL WITH INSTRUMENT CASE 3'-4¼" HIGH, COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING, S-2090-31 OR 2" CABLE OUTLET, S-2090-22.



POSITION LIGHT TAKE SIDING AND TELEPHONE
TRAIN ORDER-SEARCHLIGHT GROUND SIGNAL

ONE SEARCHLIGHT UNIT AND ONE POSITION LIGHT UNIT	DESCRIPTION
S-2124-3	ONE SEARCHLIGHT UNIT AND ONE POSITION LIGHT UNIT GROUND SIGNAL WITH INSTRUMENT CASE 5'-0¼" HIGH, COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING, S-2090-32 OR 2 CABLE OUTLET, S-2090-22.

NOTES

1. EACH SIGNAL UNIT SHALL BE FURNISHED WITH ONE 2" I.D. SINGLE STRIP GALV. FLEXIBLE CONDUIT AND FITTINGS.
2. THE WIRE OUTLET FITTING AT THE MAST USED WITH THE POSITION LIGHT UNIT SHALL BE OF A TYPE TO CLAMP TO MAST WITH A "U" BOLT, 1 7/8" HOLE BEING REQUIRED IN THE MAST FOR THE FITTING. IF MAST FURNISHED IS DRILLED FOR THE LOWER SEARCHLIGHT SIGNAL UNIT, THE HOLE SHALL BE PLUGGED WITH 2" PIPE PLUG.
3. WHEN ORDERING POSITION LIGHT UNIT ONLY, SPECIFY 22" LENGTH OF FLEXIBLE CONDUIT.

SCALE IN FEET
0 1 2 3 4 5 6 7 8

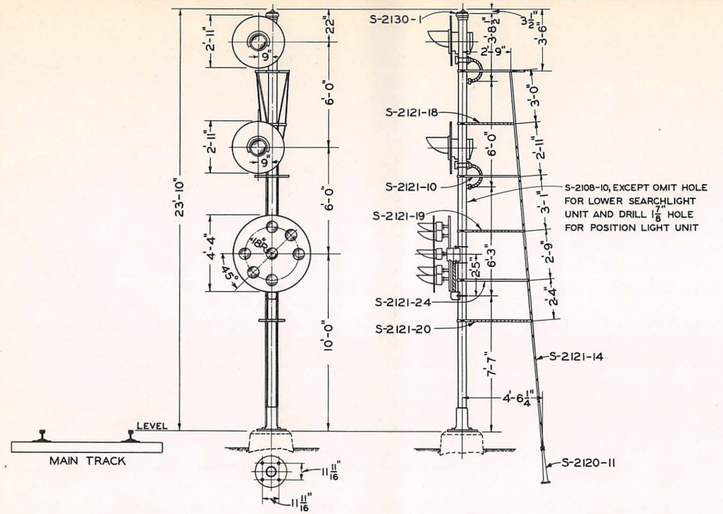
APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT		
C. H. W. K. L. M.	C. D. M.	A. J. P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

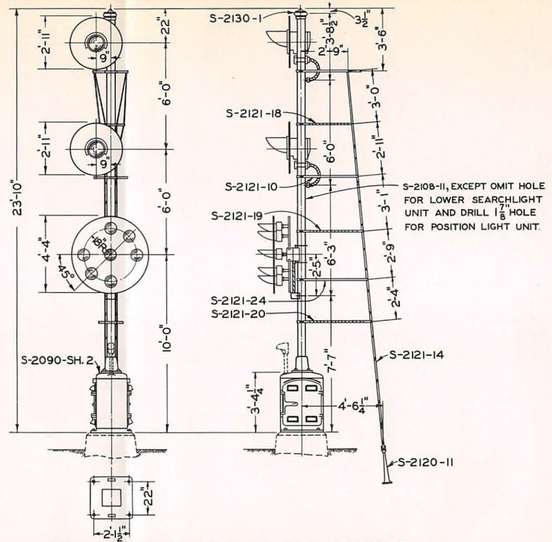
APPLICATION OF POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER SIGNAL TO ONE UNIT SEARCHLIGHT GROUND SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: ..... JULY 21, 1936
CHIEF ENGINEER



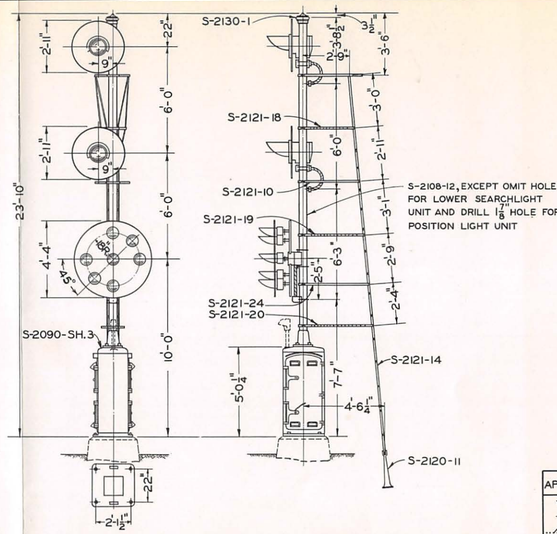
POSITION LIGHT TAKE SIDING AND TELEPHONE
TRAIN ORDER-SEARCHLIGHT GROUND SIGNAL

TWO SEARCHLIGHT UNITS AND ONE POSITION LIGHT UNIT	DESCRIPTION
S-2125-1	TWO SEARCHLIGHT UNITS AND ONE POSITION LIGHT UNIT GROUND SIGNAL FOR MOUNTING ON CONCRETE FOUNDATION, COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS.



POSITION LIGHT TAKE SIDING AND TELEPHONE
TRAIN ORDER-SEARCHLIGHT GROUND SIGNAL

TWO SEARCHLIGHT UNITS AND ONE POSITION LIGHT UNIT	DESCRIPTION
S-2125-2	TWO SEARCHLIGHT UNITS AND ONE POSITION LIGHT UNIT GROUND SIGNAL WITH INSTRUMENT CASE 3'-4 1/4" HIGH, COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING, S-2090-31 OR 2" CABLE OUTLET, S-2090-22.



POSITION LIGHT TAKE SIDING AND TELEPHONE
TRAIN ORDER-SEARCHLIGHT GROUND SIGNAL

TWO SEARCHLIGHT UNITS AND ONE POSITION LIGHT UNIT	DESCRIPTION
S-2125-3	TWO SEARCHLIGHT UNITS AND ONE POSITION LIGHT UNIT GROUND SIGNAL WITH INSTRUMENT CASE 5'-0 1/4" HIGH, COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS. SPECIFY WITH OR WITHOUT INSTRUMENT CASE LINING, S-2090-32 OR 2" CABLE OUTLET, S-2090-22.

NOTES

1. EACH SIGNAL UNIT SHALL BE FURNISHED WITH ONE 2" I. D. SINGLE STRIP GALV. FLEXIBLE CONDUIT AND FITTINGS.
2. THE WIRE OUTLET FITTING AT THE MAST USED WITH THE POSITION LIGHT UNIT SHALL BE OF A TYPE TO CLAMP TO MAST WITH A "U" BOLT, 1 7/8" HOLE BEING REQUIRED IN THE MAST FOR THE FITTING. IF MAST FURNISHED IS DRILLED FOR THE LOWER SEARCHLIGHT SIGNAL UNIT, THE HOLE SHALL BE PLUGGED WITH 2" PIPE PLUG.
3. WHEN ORDERING POSITION LIGHT UNIT ONLY, SPECIFY 22" LENGTH OF FLEXIBLE CONDUIT.

SCALE IN FEET
0 1 2 3 4 5 6 7 8

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

C.H.W. C.D.M. A.J.P.
C.H.W.

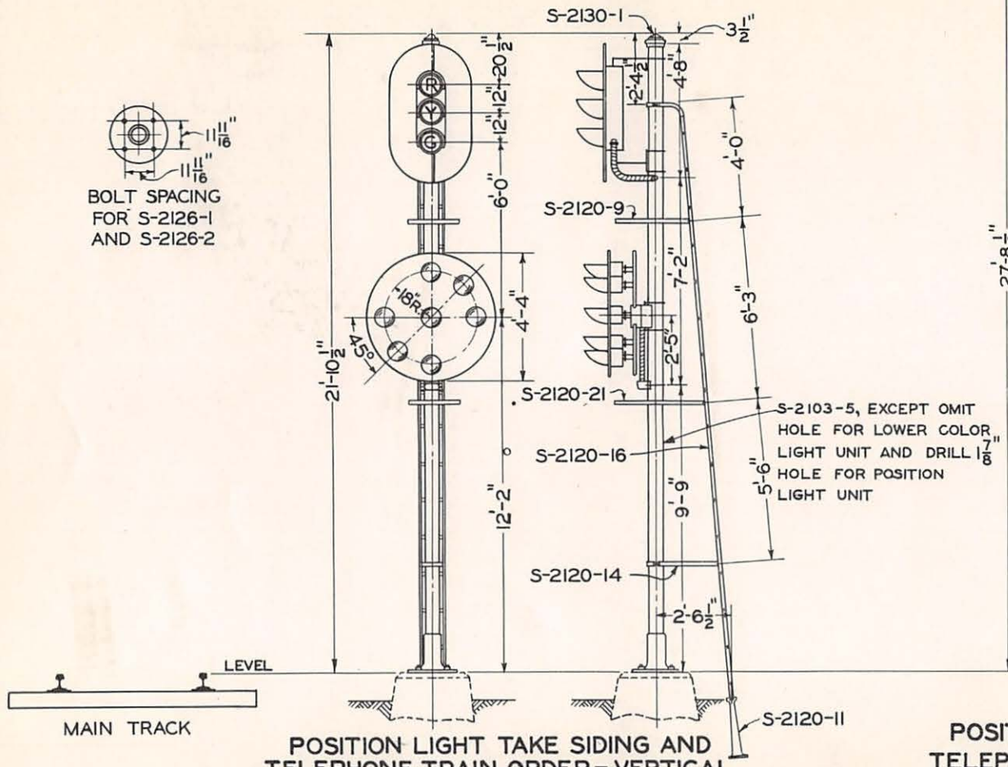
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY
STANDARD

APPLICATION OF POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER SIGNAL TO TWO UNIT SEARCHLIGHT GROUND SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JULY 21, 1936
CHIEF ENGINEER

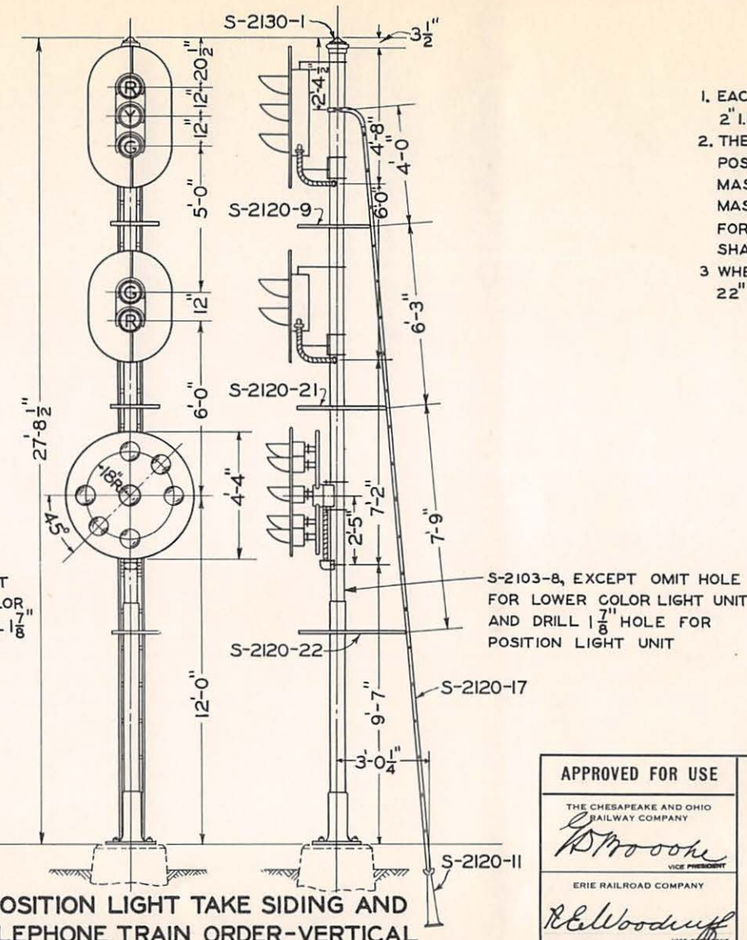
S-2125

BOLT SPACING FOR S-2126-1 AND S-2126-2



POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER-VERTICAL COLOR LIGHT GROUND SIGNAL

ONE VERTICAL COLOR LIGHT UNIT AND ONE POSITION LIGHT UNIT	DESCRIPTION
S-2126-1	ONE VERTICAL COLOR LIGHT UNIT AND ONE POSITION LIGHT UNIT GROUND SIGNAL FOR MOUNTING ON CONCRETE FOUNDATION, COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS.



POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER-VERTICAL COLOR LIGHT GROUND SIGNAL

TWO VERTICAL COLOR LIGHT UNITS AND ONE POSITION LIGHT UNIT	DESCRIPTION
S-2126-2	TWO VERTICAL COLOR LIGHT UNITS AND ONE POSITION LIGHT UNIT GROUND SIGNAL FOR MOUNTING ON CONCRETE FOUNDATION, COMPLETE EXCEPT WITHOUT FOUNDATION BOLTS AND LAMPS.

NOTES

1. EACH SIGNAL UNIT SHALL BE FURNISHED WITH ONE 2" I.D. SINGLE STRIP GALV. FLEXIBLE CONDUIT AND FITTINGS.
2. THE WIRE OUTLET FITTING AT THE MAST USED WITH THE POSITION LIGHT UNIT SHALL BE OF A TYPE TO CLAMP TO MAST WITH A "U" BOLT, 1 7/8" HOLE BEING REQUIRED IN THE MAST FOR THE FITTING. IF MAST FURNISHED IS DRILLED FOR THE LOWER COLOR LIGHT SIGNAL UNIT, THE HOLE SHALL BE PLUGGED WITH 2" PIPE PLUG.
3. WHEN ORDERING POSITION LIGHT UNIT ONLY, SPECIFY 22" LENGTH OF FLEXIBLE CONDUIT.

SCALE IN INCHES
0 1 2 3 4 5 6 7 8

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
R D Moodie VICE PRESIDENT

ERIE RAILROAD COMPANY
R E Woodruff VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
R D Moodie VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A A Browman VICE PRESIDENT

K.L.M.	C.D.M.	A.J.P.
K.L.M.		

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ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

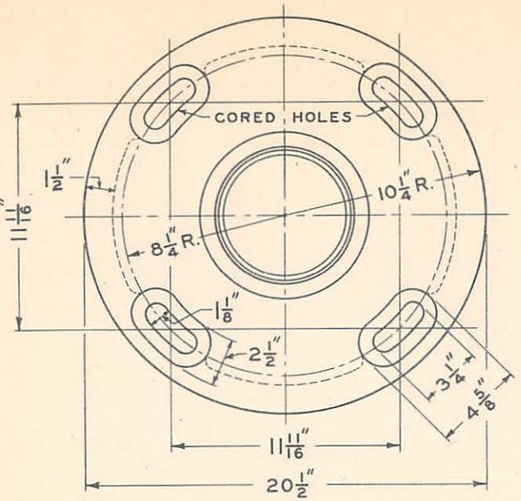
STANDARD

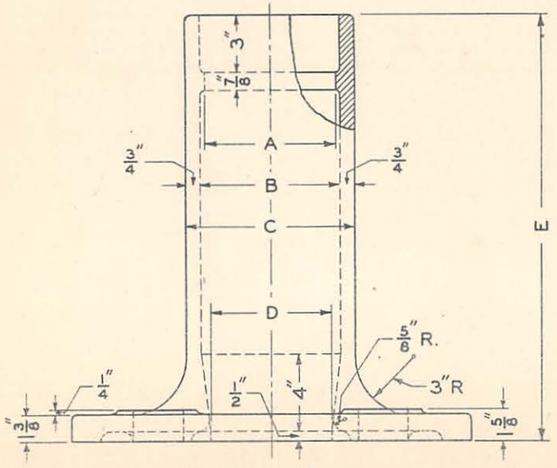
APPLICATION OF POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER SIGNAL TO VERTICAL COLOR LIGHT GROUND SIGNAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: A Mitchell CHIEF ENGINEER JULY 21, 1936

S-2126

GROUND SIGNAL BASE						
REFERENCE	DIA. PIPE	A	B	C	D	E
S-2128-1	5"	$5\frac{21}{32}" \pm \frac{1}{32}"$	$6\frac{3}{32}" \pm \frac{3}{32}"$	$7\frac{19}{32}" \pm \frac{13}{32}"$	$5\frac{3}{32}" \pm \frac{1}{32}"$	16"
S-2128-2	6"	$6\frac{3}{4}"$	$7\frac{1}{8}"$	$8\frac{5}{8}"$	$6\frac{1}{4}"$	22"

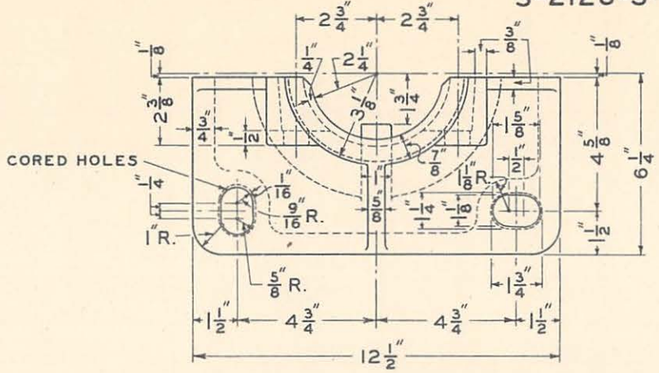


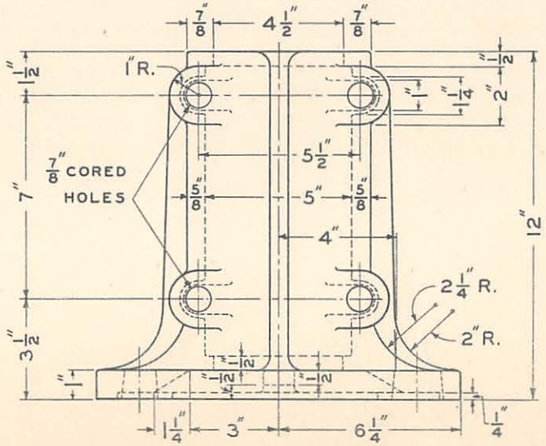


SCALE ①

S-2128-1 GROUND SIGNAL BASE FOR 5" PIPE
S-2128-2 GROUND SIGNAL BASE FOR 6" PIPE
CAST IRON

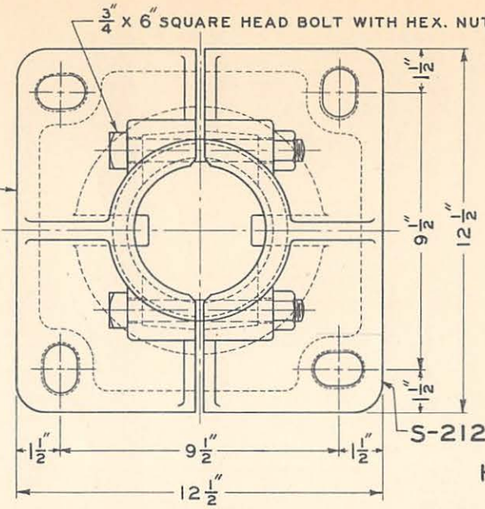
S-2128-3





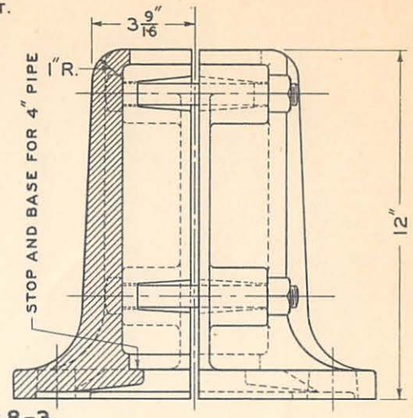
SCALE ②

S-2128-3 CLAMP BASE HALF
CAST IRON



SCALE ②

S-2128-4 CLAMP BASE
COMPLETE
FOR 4" PIPE

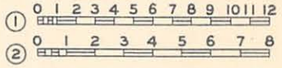


SCALE ②

HALF SECTION-ELEVATION

NOTE:
BASES SHALL BE PAINTED INSIDE AND OUT WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES



APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
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EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
W. D. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
J. M. Davis
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
O. J. Bowman
PRESIDENT

W.S.E.	W.S.E.	W.N.H.

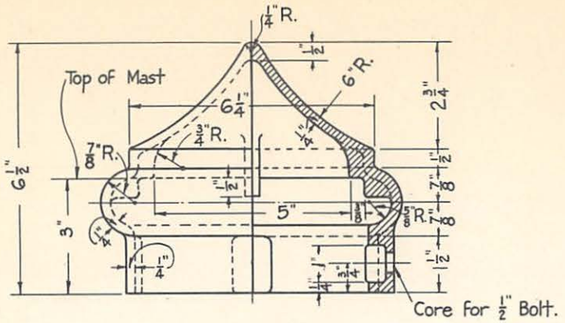
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD BASES FOR 4, 5, AND 6 INCH PIPE MASTS

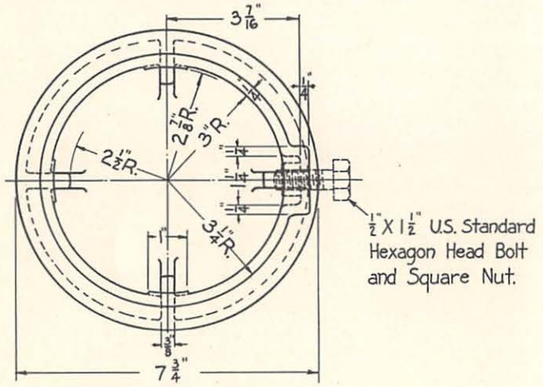
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. E. Wallace
CHAIRMAN

SEPT. 14, 1944

S-2128-A



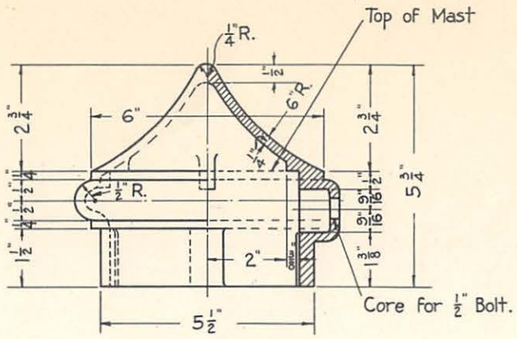
HALF SECTION



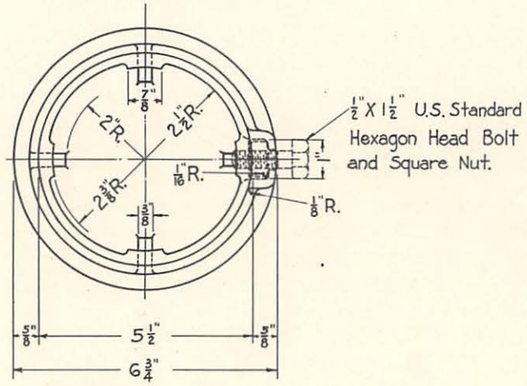
INVERTED VIEW

S-2130-1 PINNACLE FOR 5 INCH MAST

CAST IRON



HALF SECTION



INVERTED VIEW

S-2130-2 PINNACLE FOR 4 INCH MAST

CAST IRON

NOTE

PINNACLES SHALL BE PAINTED INSIDE AND OUT WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES

0 1 2 3 4 5 6

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY

ERIE RAILROAD COMPANY

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY

PERE MARQUETTE RAILWAY COMPANY

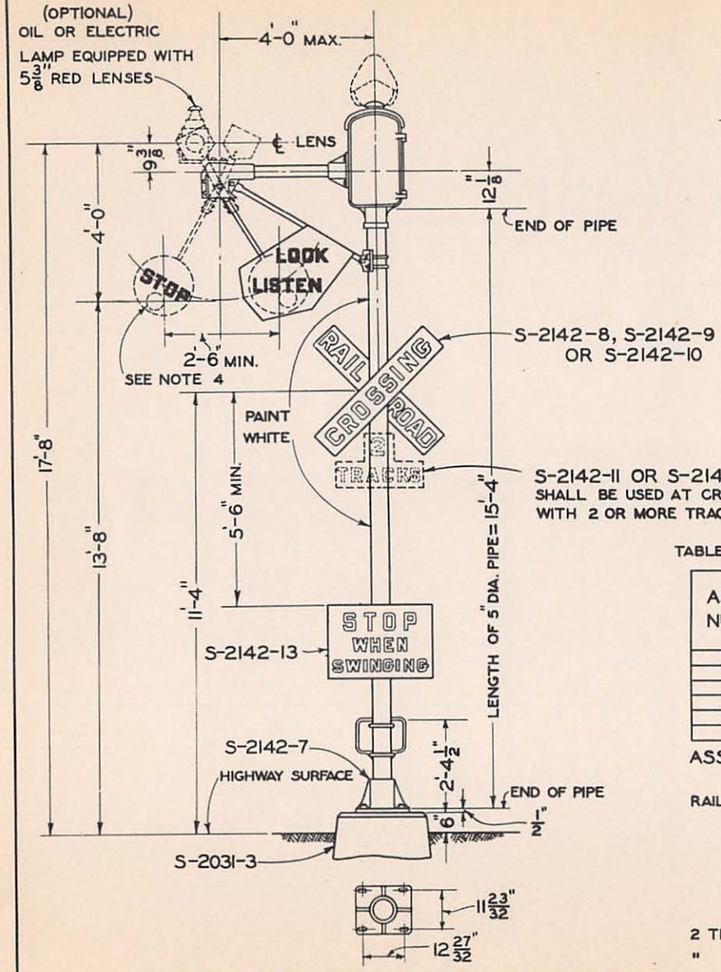
C.H.W.	C.D.M.	A.J.P.
C.H.W.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD PINNACLES FOR 4" AND 5" PIPE MASTS

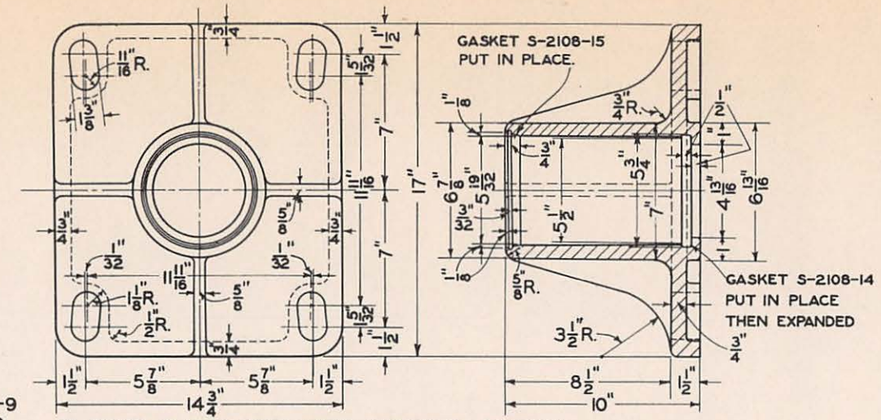
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: CHIEF ENGINEER APRIL 21, 1931

S-2130



TYPICAL ASSEMBLY—FRONT ELEVATION

SCALE ①



S-2142-7 SOCKET FOR WIGWAG SIGNAL WITH GASKETS

PRESS FIT FOR 5" PIPE

CAST IRON

SCALE ②

NOTES

1. PAINTING—LEGEND ON MASK SHALL BE IN BLACK LETTERS ON WHITE BACKGROUND. LEGEND ON DISC SHALL BE IN WHITE LETTERS ON RED BACKGROUND. ASSEMBLY SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS, EXCEPT THAT FINISHING COAT SHALL BE WHITE. THIS COAT SHALL BE APPLIED IN THE FIELD.
2. EITHER A CAST IRON SIGN OR REFLECTOR SIGN SHALL BE USED WHERE REQUIRED FOR THE FOLLOWING: RAILROAD CROSSING — 2 TRACKS.
3. MATERIAL AND DESIGN OF WIGWAG MECHANISM AND JUNCTION BOX SHALL BE IN ACCORDANCE WITH PLAN APPROVED BY PURCHASER.
4. THE DISC LIGHT UNIT SHALL BE EQUIPPED WITH 5 INCH DIAMETER RED FRONT LENS AND NOT LESS THAN 3 INCH DIAMETER RED BACK LENS.
5. SIGNAL AND INSTALLATION MUST BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD REQUISITES S-1506, HIGHWAY CROSSING SIGNALS.

TABLE SHOWING DRAWING NUMBERS ASSIGNED VARIOUS ASSEMBLIES

ASSEMBLY NUMBERS	SIGN		
	RAILROAD CROSSING	2 TRACKS SPECIFY NUMERAL REQUIRED	
S-2142-1	S-2142-8		
S-2142-2	S-2142-9		
S-2142-3	S-2142-10		
S-2142-4 *	S-2142-8	S-2142-11	
S-2142-5 *	S-2142-9	S-2142-12	
S-2142-6 *	S-2142-10	S-2142-12	

ASSEMBLY NUMBERS OF SIGNS

(FOR READY REFERENCE)

RAILROAD CROSSING, CAST IRON _____ S-2142-8

" " REFLECTOR ONE SIDE ONLY } S-2142-10

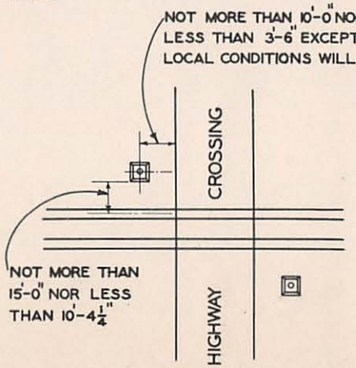
" " REFLECTOR ONE SIDE, EMBOSSED ENAMELED ONLY OTHER SIDE } S-2142-9

2 TRACKS, CAST IRON _____ S-2142-11

" " REFLECTOR _____ S-2142-12

* FOR TWO OR MORE TRACKS

SPECIAL SIGNS MAY BE ADDED AS REQUIRED BY VARIOUS STATES.



LOCATION DIAGRAM

NO SCALE

SCALE IN INCHES

① 0 12 24 36 48 60 72

② 0 2 4 6 8 10 12

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Brooke, VICE PRESIDENT

ERIE RAILROAD COMPANY — R E Woodruff, VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D Brooke, VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — R H Bowman, VICE PRESIDENT

K.L.M.	C.D.M.	A.J.P.
K.L.M.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD
WIGWAG SIGNAL
FOR USE IN THE UNITED STATES

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: C Mitchell, CHIEF ENGINEER
APRIL 17, 1934

SHEET 1 OF 2

S-2142

ASSEMBLY NUMBERS OF SIGNS FOR USE ON 5" PIPE

S-2142-8 90° CAST IRON CROSSING SIGN
S-2150-5 EXCEPT ASSEMBLED WITH 4 BOLTS, S-2142-16 FOR 5" PIPE, IN PLACE OF 4 BOLTS S-2150-4, FOR 4" PIPE.

S-2142-9 RAILROAD CROSSING SIGN REFLECTOR UNIT
S-2150-10 EXCEPT ASSEMBLED WITH 4 BOLTS, S-2142-16 FOR 5" PIPE, IN PLACE OF 4 BOLTS S-2150-4, FOR 4" PIPE.

S-2142-10 RAILROAD CROSSING SIGN REFLECTOR UNIT
S-2150-57 EXCEPT ASSEMBLED WITH 2 U BOLTS, S-2142-17 FOR 5" PIPE, IN PLACE OF 2 U BOLTS S-2150-14, FOR 4" PIPE.

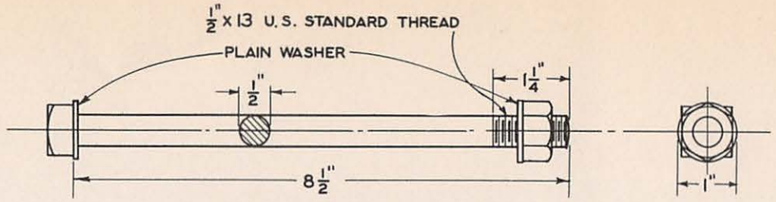
S-2142-11 TRACKS SIGN CAST IRON
S-2150-29 EXCEPT ASSEMBLED WITH 2 U BOLTS, S-2142-17 FOR 5" PIPE, IN PLACE OF 2 U BOLTS S-2150-14, FOR 4" PIPE.

S-2142-12 TRACKS SIGN REFLECTOR UNIT
S-2150-48 EXCEPT ASSEMBLED WITH 2 U BOLTS, S-2142-17 FOR 5" PIPE, IN PLACE OF 2 U BOLTS S-2150-14, FOR 4" PIPE.

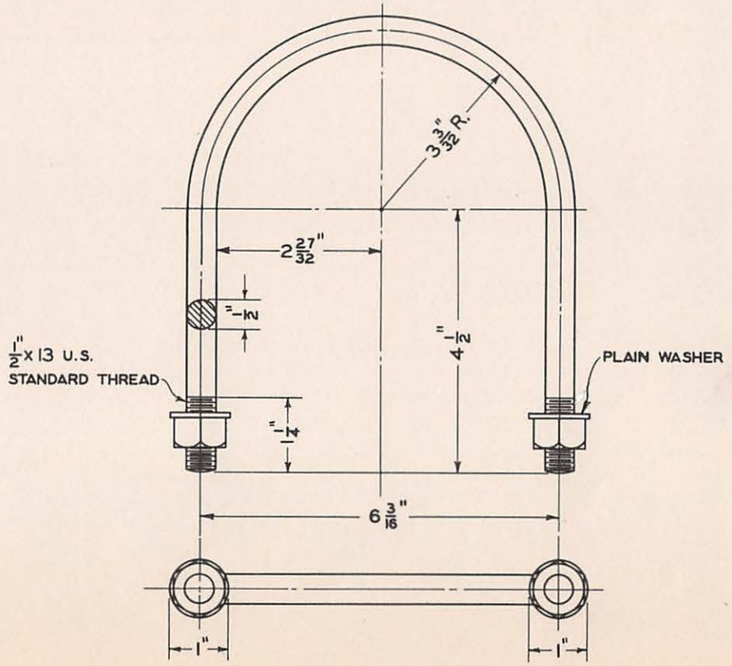
S-2142-13 STOP WHEN SWINGING SIGN
S-2150-59 EXCEPT ASSEMBLED WITH 2 U BOLTS S-2142-17, FOR 5" PIPE. IN PLACE OF 2 U BOLTS S-2150-14 FOR 4" PIPE.

S-2142-14 DANGER SIGN CAST IRON
S-2150-16 EXCEPT ASSEMBLED WITH 2 U BOLTS S-2142-17, FOR 5" PIPE, IN PLACE OF 2 U BOLTS S-2150-14, FOR 4" PIPE.

S-2142-15 DANGER SIGN REFLECTOR UNIT
S-2150-17 EXCEPT ASSEMBLED WITH 2 U BOLTS S-2142-17, FOR 5" PIPE, IN PLACE OF 2 U BOLTS S-2150-14, FOR 4" PIPE.



S-2142-16 BOLT FOR 5" PIPE
O.-H. STEEL



S-2142-17 U BOLT
FOR 5" PIPE
O.-H. STEEL

SCALE IN INCHES
0 1 2 3 4

APPROVED FOR USE			
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT			
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THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT			
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT			
K. L. M.	C. D. M.	A. J. P.	
K. L. M.			

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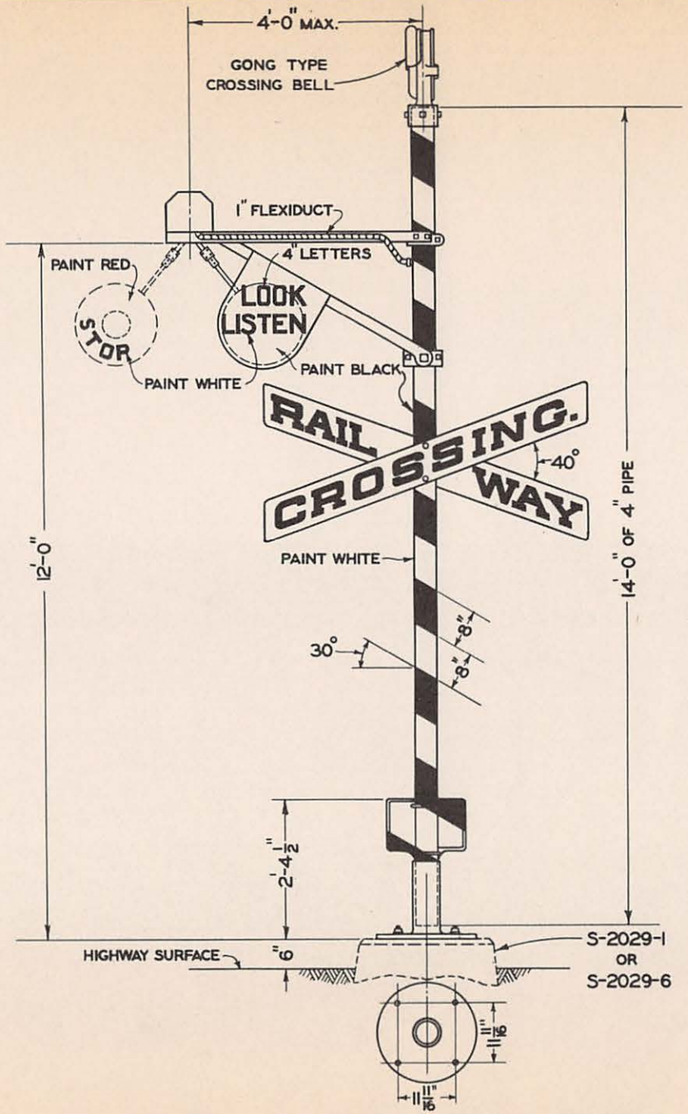
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD WIGWAG SIGNAL

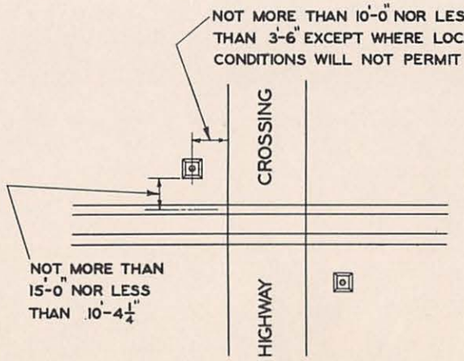
FOR USE IN THE UNITED STATES

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: APRIL 17, 1934
CHIEF ENGINEER

SHEET 2 OF 2
S-2142



TYPICAL ASSEMBLY - FRONT ELEVATION


NOT MORE THAN 10'-0" NOR LESS THAN 3'-6" EXCEPT WHERE LOCAL CONDITIONS WILL NOT PERMIT
CROSSING
HIGHWAY
NOT MORE THAN 15'-0" NOR LESS THAN 10'-4 1/4"

LOCATION DIAGRAM
NO SCALE

NOTES

1. BANNER SHALL BE EQUIPPED WITH 5 3/8" DAY-LITE LENS AND ENAMELED RED WITH WORD "STOP" IN WHITE.
2. WIGWAG SHALL BE FURNISHED WITH 1" FLEXIDUCT AND FITTINGS FROM PIPE POST TO OPERATING MECHANISM AND A JUNCTION BOX WITH 4 TERMINALS ARRANGED FOR ENTRANCE OF UNDERGROUND CABLE THROUGH BASE OF WIGWAG MAST.
3. MATERIAL AND DESIGN OF WIGWAG MECHANISM, CROSSBUCK SIGN, AND JUNCTION BOX SHALL BE IN ACCORDANCE WITH PLAN APPROVED BY PURCHASER.
4. SIGNAL AND INSTALLATION MUST BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD REQUISITES S-1506, HIGHWAY CROSSING SIGNALS.

SCALE IN FEET
0 1 2 3 4

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Brooke
VICE PRESIDENT

ERIE RAILROAD COMPANY
R E Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Brooke
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PERE MARQUETTE RAILWAY COMPANY
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K.L.M.		

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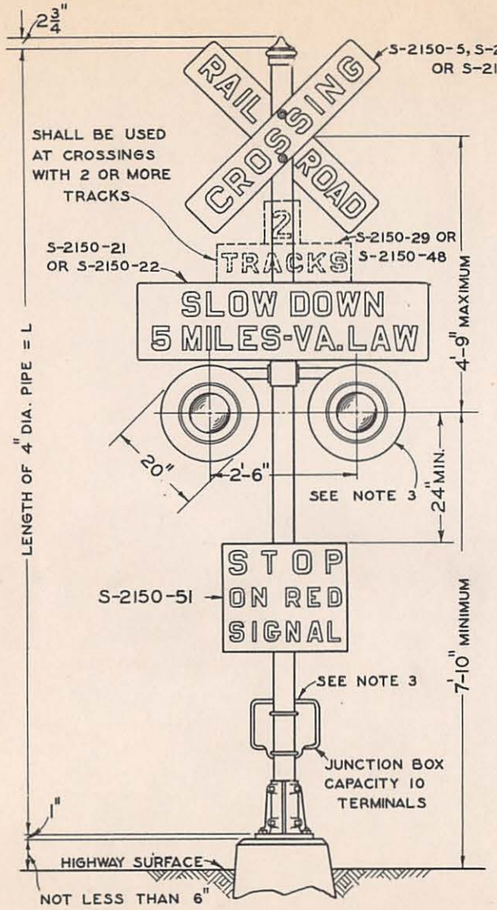
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD
WIGWAG SIGNAL
FOR USE IN CANADA

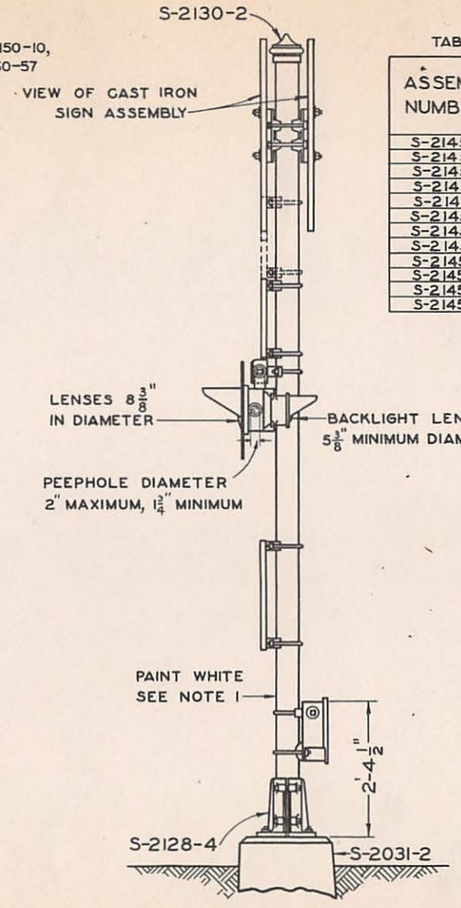
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: C Churchill CHIEF ENGINEER APRIL 17, 1934.

S-2143



TYPICAL ASSEMBLY-FRONT ELEVATION

L=13'-6" FOR ONE SET OF FLASHER UNITS
L=15'-6" FOR TWO SETS OF FLASHER UNITS



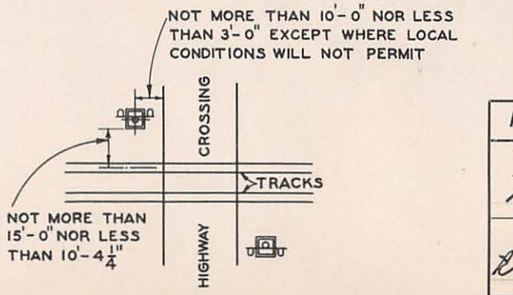
SIDE ELEVATION

TABLE SHOWING DRAWING NUMBERS ASSIGNED VARIOUS ASSEMBLIES

ASSEMBLY NUMBERS	SIGN			SETS OF FLASHER UNITS
	RAILROAD CROSSING	2 TRACKS SPECIFY NUMERAL REQUIRED	SLOW DOWN 5 MILES-VA. LAW	
S-2145-1	S-2150-5	———	S-2150-21	ONE
S-2145-2	S-2150-10	———	S-2150-22	ONE
S-2145-3	S-2150-57	———	S-2150-22	ONE
S-2145-4*	S-2150-5	S-2150-29	S-2150-21	ONE
S-2145-5*	S-2150-10	S-2150-48	S-2150-22	ONE
S-2145-6*	S-2150-57	S-2150-48	S-2150-22	ONE
S-2145-7	S-2150-5	———	S-2150-21	TWO
S-2145-8	S-2150-10	———	S-2150-22	TWO
S-2145-9	S-2150-57	———	S-2150-22	TWO
S-2145-10*	S-2150-5	S-2150-29	S-2150-21	TWO
S-2145-11*	S-2150-10	S-2150-48	S-2150-22	TWO
S-2145-12*	S-2150-57	S-2150-48	S-2150-22	TWO

ASSEMBLY NUMBERS OF SIGNS
(FOR READY REFERENCE)

RAILROAD CROSSING, CAST IRON ----- S-2150-5
" " REFLECTOR ONE SIDE ONLY } --S-2150-57
" " REFLECTOR ONE SIDE, EMBOSSED ENAMELED ONLY OTHER SIDE } --S-2150-10
SLOW DOWN 5 MILES-VA. LAW, CAST IRON --- S-2150-21
" " " " " " REFLECTOR --- S-2150-22
2 TRACKS, CAST IRON ---------- S-2150-29
" " REFLECTOR ---------- S-2150-48
* FOR TWO OR MORE TRACKS


NOT MORE THAN 10'-0" NOR LESS THAN 3'-0" EXCEPT WHERE LOCAL CONDITIONS WILL NOT PERMIT
CROSSING
TRACKS
HIGHWAY
NOT MORE THAN 15'-0" NOR LESS THAN 10'-4 1/4"

LOCATION DIAGRAM

NO SCALE

NOTES

1. PAINTING:- THE LAMP CASE, HOOD, AND BACKGROUND OF FLASHER UNITS SHALL BE PAINTED BLACK. ALL OTHER PARTS SHALL BE PAINTED WHITE EXCEPT LETTERED SIGNS SHALL BE PAINTED IN ACCORDANCE WITH DETAIL DRAWINGS. ALL PARTS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER. THE FINISHING COAT SHALL BE APPLIED IN THE FIELD.
2. EITHER A CAST IRON SIGN OR REFLECTOR SIGN SHALL BE USED WHERE REQUIRED FOR THE FOLLOWING: RAILROAD CROSSING — 2 TRACKS — SLOW DOWN 5 MILES-VA. LAW.
3. MATERIAL AND DESIGN OF FLASHER UNITS AND JUNCTION BOX SHALL BE IN ACCORDANCE WITH PLAN APPROVED BY PURCHASER.
4. SIGNAL AND INSTALLATION MUST BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD REQUISITES S-1506, HIGHWAY CROSSING SIGNALS.

SCALE IN FEET
0 1 2 3 4

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Woodcock VICE PRESIDENT

ERIE RAILROAD COMPANY
R.H. Woodruff VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Woodcock VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A.J. Bowman VICE PRESIDENT

K.L.M. | C.D.M. | A.J.P.
C.H.W.

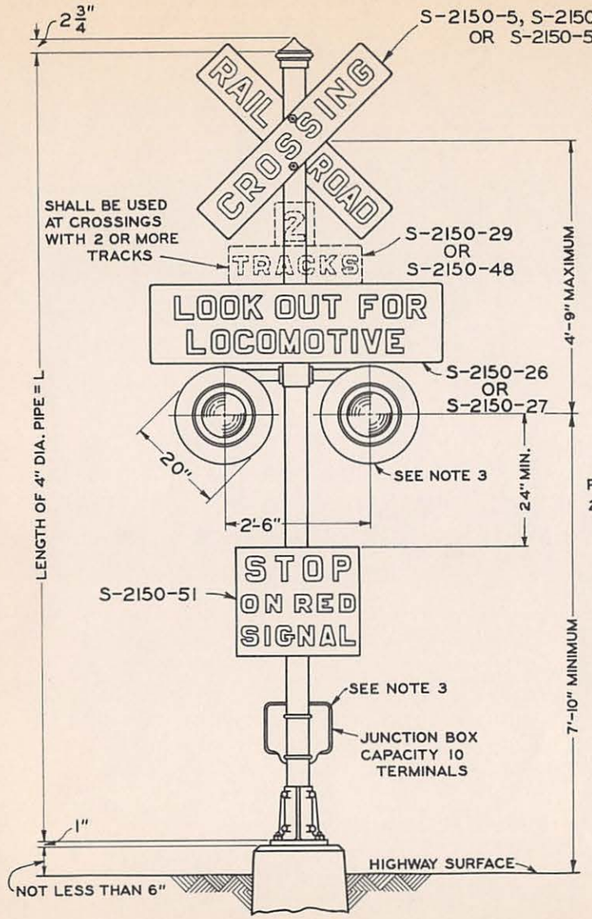
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD HIGHWAY CROSSING SIGNAL

FOR USE IN VIRGINIA

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: A Merrill CHIEF ENGINEER APRIL 17, 1934.

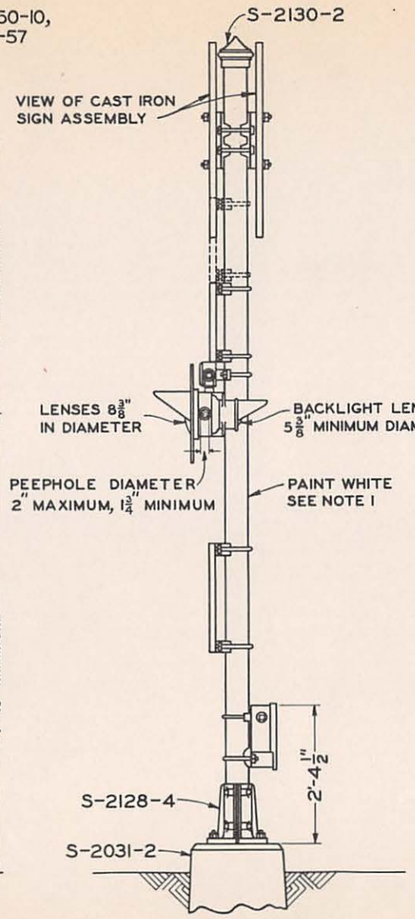
S-2145



TYPICAL ASSEMBLY-FRONT ELEVATION

L = 13'-6" FOR ONE SET OF FLASHER UNITS

L = 15'-6" FOR TWO SETS OF FLASHER UNITS



SIDE ELEVATION

TABLE SHOWING DRAWING NUMBERS ASSIGNED VARIOUS ASSEMBLIES

ASSEMBLY NUMBERS	SIGN			SETS OF FLASHER UNITS
	RAILROAD CROSSING	2 TRACKS SPECIFY NUMERAL REQUIRED	LOOK OUT FOR LOCOMOTIVE	
S-2146-1	S-2150-5	———	S-2150-26	ONE
S-2146-2	S-2150-10	———	S-2150-27	ONE
S-2146-3	S-2150-57	———	S-2150-27	ONE
S-2146-4 *	S-2150-5	S-2150-29	S-2150-26	ONE
S-2146-5 *	S-2150-10	S-2150-48	S-2150-27	ONE
S-2146-6 *	S-2150-57	S-2150-48	S-2150-27	ONE
S-2146-7	S-2150-5	———	S-2150-26	TWO
S-2146-8	S-2150-10	———	S-2150-27	TWO
S-2146-9	S-2150-57	———	S-2150-27	TWO
S-2146-10 *	S-2150-5	S-2150-29	S-2150-26	TWO
S-2146-11 *	S-2150-10	S-2150-48	S-2150-27	TWO
S-2146-12 *	S-2150-57	S-2150-48	S-2150-27	TWO

ASSEMBLY NUMBERS OF SIGNS
(FOR READY REFERENCE)

RAILROAD CROSSING, CAST IRON ——— S-2150-5

" " REFLECTOR ONE SIDE ONLY ——— S-2150-57

" " REFLECTOR ONE SIDE, EMBOSSED ENAMELED ONLY OTHER SIDE ——— S-2150-10

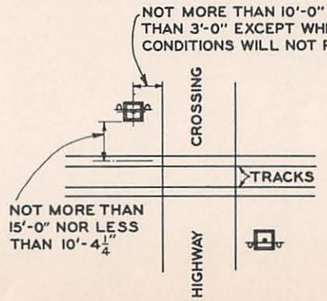
2 TRACKS, CAST IRON ——— S-2150-29

" " REFLECTOR ——— S-2150-48

LOOK OUT FOR LOCOMOTIVE, CAST IRON ——— S-2150-26

REFLECTOR ——— S-2150-27

* FOR TWO OR MORE TRACKS


NOT MORE THAN 10'-0" NOR LESS THAN 3'-0" EXCEPT WHERE LOCAL CONDITIONS WILL NOT PERMIT
CROSSING
TRACKS
HIGHWAY
NOT MORE THAN 15'-0" NOR LESS THAN 10'-4 1/4"

LOCATION DIAGRAM
NO SCALE

NOTES

1. PAINTING:- THE LAMP CASE, HOOD, AND BACKGROUND OF FLASHER UNITS SHALL BE PAINTED BLACK. ALL OTHER PARTS SHALL BE PAINTED WHITE EXCEPT LETTERED SIGNS SHALL BE PAINTED IN ACCORDANCE WITH DETAIL DRAWINGS. ALL PARTS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER. THE FINISHING COAT SHALL BE APPLIED IN THE FIELD.
2. EITHER A CAST IRON SIGN OR REFLECTOR SIGN SHALL BE USED WHERE REQUIRED FOR THE FOLLOWING: RAILROAD CROSSING — 2 TRACKS — LOOK OUT FOR LOCOMOTIVE.
3. MATERIAL AND DESIGN OF FLASHER UNITS AND JUNCTION BOX SHALL BE IN ACCORDANCE WITH PLAN APPROVED BY PURCHASER.
4. SIGNAL AND INSTALLATION MUST BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD REQUISITES S-1506, HIGHWAY CROSSING SIGNALS.

SCALE IN FEET
0 1 2 3 4

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D B Brooke
VICE PRESIDENT

ERIE RAILROAD COMPANY
R E Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D B Brooke
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
R H Bowman
VICE PRESIDENT

K.L.M. C.B.P. C.D.M. A.J.P.

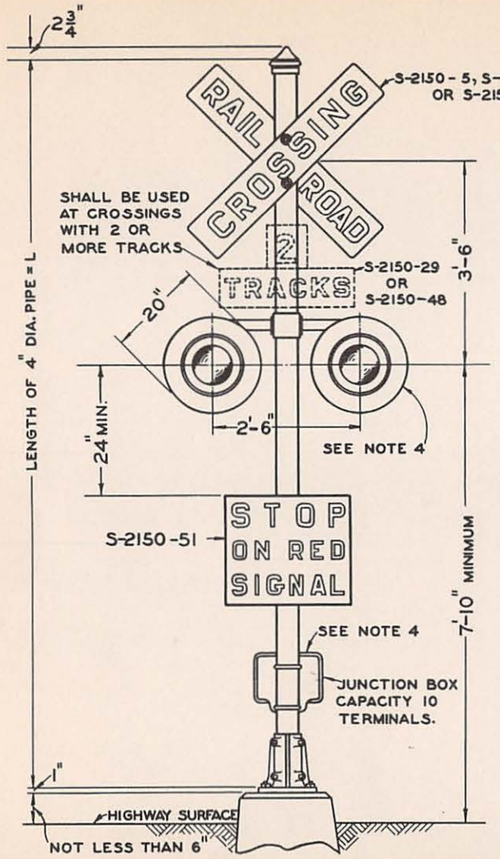
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD HIGHWAY CROSSING SIGNAL

FOR USE IN WEST VIRGINIA

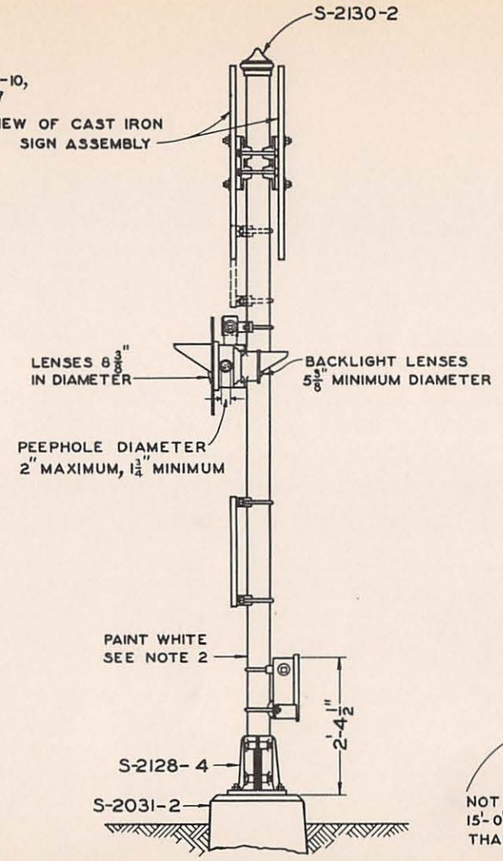
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: A Arundel CHIEF ENGINEER APRIL 17, 1934.

S-2146



TYPICAL ASSEMBLY- FRONT ELEVATION

L= 12'-6" FOR ONE SET OF FLASHER UNITS
L= 14'-0" FOR TWO SETS OF FLASHER UNITS



SIDE ELEVATION

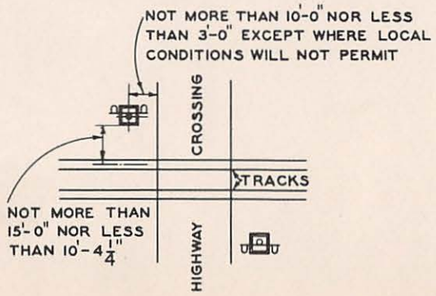
TABLE SHOWING DRAWING NUMBERS ASSIGNED VARIOUS ASSEMBLIES

ASSEMBLY NUMBERS	SIGN		SETS OF FLASHER UNITS
	RAILROAD CROSSING	2 TRACKS SPECIFY NUMERAL REQUIRED	
S-2147-1	S-2150-5	———	ONE
S-2147-2	S-2150-10	———	ONE
S-2147-3	S-2150-57	———	ONE
S-2147-4*	S-2150-5	S-2150-29	ONE
S-2147-5*	S-2150-10	S-2150-48	ONE
S-2147-6*	S-2150-57	S-2150-48	ONE
S-2147-7	S-2150-5	———	TWO
S-2147-8	S-2150-10	———	TWO
S-2147-9	S-2150-57	———	TWO
S-2147-10*	S-2150-5	S-2150-29	TWO
S-2147-11*	S-2150-10	S-2150-48	TWO
S-2147-12*	S-2150-57	S-2150-48	TWO

ASSEMBLY NUMBERS OF SIGNS
(FOR READY REFERENCE)

RAILROAD CROSSING, CAST IRON ——— S-2150-5
" " REFLECTOR ONE SIDE ONLY ——— S-2150-57
" " REFLECTOR ONE SIDE, EMBOSSED ENAMELED ONLY OTHER SIDE ——— S-2150-10
2 TRACKS, CAST IRON ——— S-2150-29
" " REFLECTOR ——— S-2150-48

* FOR TWO OR MORE TRACKS


NOT MORE THAN 10'-0" NOR LESS THAN 3'-0" EXCEPT WHERE LOCAL CONDITIONS WILL NOT PERMIT
CROSSING
TRACKS
HIGHWAY
NOT MORE THAN 15'-0" NOR LESS THAN 10'-4 1/4"

LOCATION DIAGRAM
NO SCALE

NOTES

1. ALL PLANS OF PROPOSED INSTALLATIONS OF FLASHING SIGNALS IN THE COMMONWEALTH OF PENNSYLVANIA MUST BE SUBMITTED TO THE BUREAU OF ACCIDENTS OF THE PUBLIC SERVICE COMMISSION FOR APPROVAL, PRIOR TO INSTALLATION.
2. PAINTING,-THE LAMP CASE, HOOD, AND BACKGROUND OF FLASHER UNITS SHALL BE PAINTED BLACK. ALL OTHER PARTS SHALL BE PAINTED WHITE EXCEPT LETTERED SIGNS SHALL BE PAINTED IN ACCORDANCE WITH DETAIL DRAWINGS. ALL PARTS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER. THE FINISHING COAT SHALL BE APPLIED IN THE FIELD.
3. EITHER A CAST IRON SIGN OR REFLECTOR SIGN SHALL BE USED WHERE REQUIRED FOR THE FOLLOWING: RAILROAD CROSSING— 2 TRACKS.
4. MATERIAL AND DESIGN OF FLASHER UNITS AND JUNCTION BOX SHALL BE IN ACCORDANCE WITH PLAN APPROVED BY PURCHASER.
5. SIGNAL AND INSTALLATION MUST BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD REQUISITES S-1506, HIGHWAY CROSSING SIGNALS.

SCALE IN FEET
0 1 2 3 4

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Brooke VICE PRESIDENT

ERIE RAILROAD COMPANY
R Kellwoodruff VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Brooke VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
B Bowman VICE PRESIDENT

K. L. M.	C. D. M.	A. J. P.
C. H. W.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

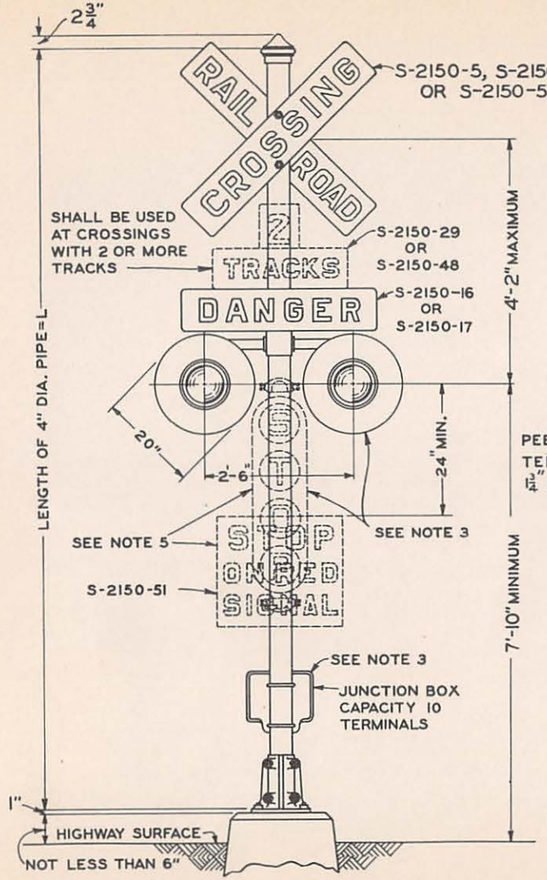
STANDARD

HIGHWAY CROSSING SIGNAL

FOR USE IN ILLINOIS, KENTUCKY, NEW JERSEY, OHIO, AND PENNSYLVANIA

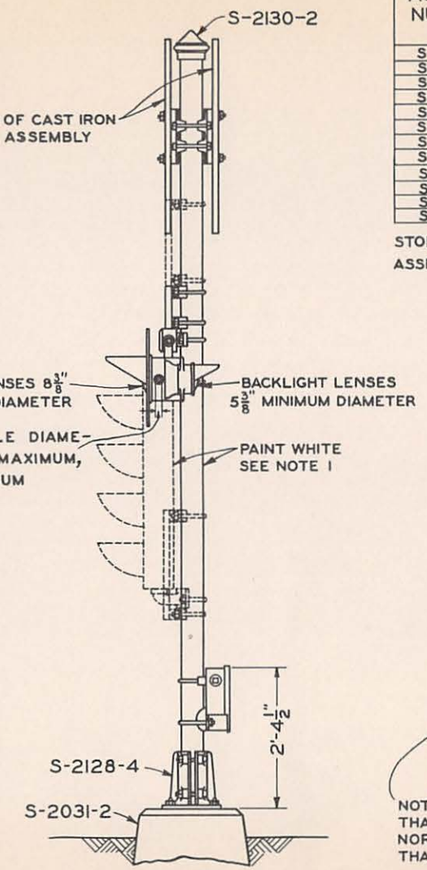
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: C Churchill CHIEF ENGINEER APRIL 17, 1934.

S-2147



TYPICAL ASSEMBLY-FRONT ELEVATION

L= 13'-0" FOR ONE SET OF FLASHER UNITS
L= 15'-0" FOR TWO SETS OF FLASHER UNITS



SIDE ELEVATION

TABLE SHOWING DRAWING NUMBERS ASSIGNED VARIOUS ASSEMBLIES

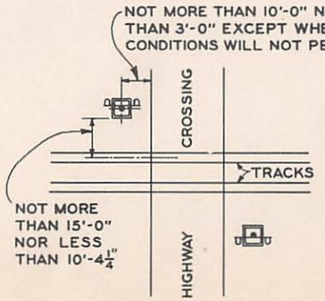
ASSEMBLY NUMBERS	SIGN			SETS OF FLASHER UNITS
	RAILROAD CROSSING	2 TRACKS SPECIFY NUMERAL REQUIRED	DANGER	
S-2148-1	S-2150-5	———	S-2150-16	ONE
S-2148-2	S-2150-10	———	S-2150-17	ONE
S-2148-3	S-2150-57	———	S-2150-17	ONE
S-2148-4 *	S-2150-5	S-2150-29	S-2150-16	ONE
S-2148-5 *	S-2150-10	S-2150-48	S-2150-17	ONE
S-2148-6 *	S-2150-57	S-2150-48	S-2150-17	ONE
S-2148-7	S-2150-5	———	S-2150-16	TWO
S-2148-8	S-2150-10	———	S-2150-17	TWO
S-2148-9	S-2150-57	———	S-2150-17	TWO
S-2148-10 *	S-2150-5	S-2150-29	S-2150-16	TWO
S-2148-11 *	S-2150-10	S-2150-48	S-2150-17	TWO
S-2148-12 *	S-2150-57	S-2150-48	S-2150-17	TWO

STOP ON RED SIGNAL SIGN S-2150-51 SHALL BE FURNISHED WITH EACH SIGNAL ASSEMBLY UNLESS OTHERWISE SPECIFIED.

ASSEMBLY NUMBERS OF SIGNS
(FOR READY REFERENCE)

RAILROAD CROSSING, CAST IRON ——— S-2150-5
" " REFLECTOR ONE SIDE ONLY ——— S-2150-57
" " REFLECTOR ONE SIDE, EMBOSSED ENAMELED ONLY OTHER SIDE ——— S-2150-10
2 TRACKS, CAST IRON ——— S-2150-29
" " REFLECTOR ——— S-2150-48
DANGER, CAST IRON ——— S-2150-16
" REFLECTOR ——— S-2150-17

* FOR TWO OR MORE TRACKS


NOT MORE THAN 10'-0" NOR LESS THAN 3'-0" EXCEPT WHERE LOCAL CONDITIONS WILL NOT PERMIT
CROSSING
TRACKS
NOT MORE THAN 15'-0" NOR LESS THAN 10'-4¼"
HIGHWAY

LOCATION DIAGRAM
NO SCALE

NOTES

1. PAINTING,— THE LAMP CASE AND BACKGROUND OF FLASHER UNITS, HOODS, AND FACE OF ILLUMINATED STOP SIGN SHALL BE PAINTED BLACK. ALL OTHER PARTS SHALL BE PAINTED WHITE EXCEPT LETTERED SIGNS SHALL BE PAINTED IN ACCORDANCE WITH DETAIL DRAWINGS. ALL PARTS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER. THE FINISHING COAT SHALL BE APPLIED IN THE FIELD.
2. EITHER A CAST IRON SIGN OR REFLECTOR SIGN SHALL BE USED WHERE REQUIRED FOR THE FOLLOWING: DANGER—RAILROAD CROSSING— 2 TRACKS.
3. MATERIAL AND DESIGN OF FLASHER UNITS, ILLUMINATED STOP SIGN, AND JUNCTION BOX SHALL BE IN ACCORDANCE WITH PLAN APPROVED BY PURCHASER.
4. SIGNAL AND INSTALLATION MUST BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD REQUISITES S-1506, HIGHWAY CROSSING SIGNALS.
5. EITHER STOP ON RED SIGNAL SIGN OR ILLUMINATED STOP SIGN SHALL BE USED ON EACH SIGNAL AS REQUIRED.

SCALE IN FEET
0 1 2 3 4

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Boooke
VICE PRESIDENT

ERIE RAILROAD COMPANY
R Galbooduff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Boooke
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
R Bowman
VICE PRESIDENT

APPROVED: W Michel CHIEF ENGINEER APRIL 17, 1934.

K. L. M.	C. D. M.	A. J. P.
C. B. P.		

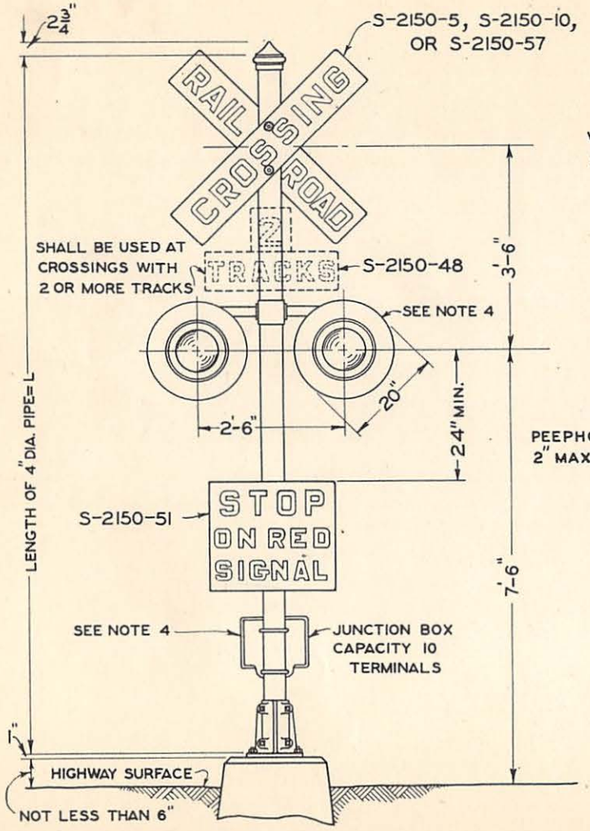
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD HIGHWAY CROSSING SIGNAL

FOR USE IN INDIANA

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

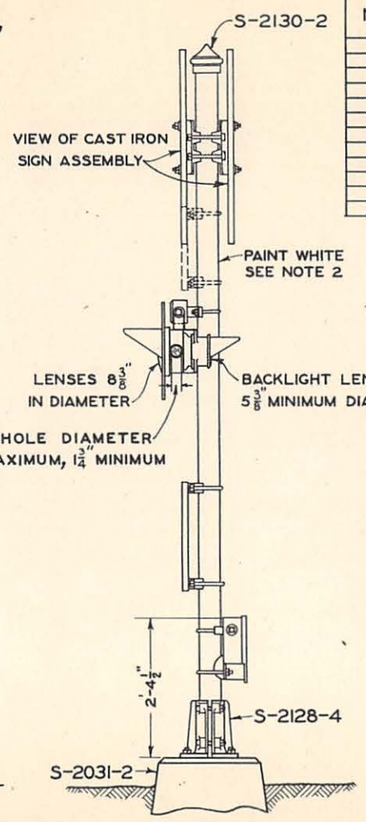
S-2148



TYPICAL ASSEMBLY-FRONT ELEVATION

L = 12'-0" FOR ONE SET OF FLASHERS

L = 14'-0" FOR TWO SETS OF FLASHERS



SIDE ELEVATION

TABLE SHOWING DRAWING NUMBERS ASSIGNED VARIOUS ASSEMBLIES.

ASSEMBLY NUMBERS	SIGN		SETS OF FLASHER UNITS
	RAILROAD CROSSING	2 TRACKS SPECIFY NUMERAL REQUIRED	
S-2149-1	S-2150-5	———	ONE
S-2149-2	S-2150-10	———	ONE
S-2149-3	S-2150-57	———	ONE
S-2149-4 *	S-2150-5	S-2150-48	ONE
S-2149-5 *	S-2150-10	S-2150-48	ONE
S-2149-6 *	S-2150-57	S-2150-48	ONE
S-2149-7	S-2150-5	———	TWO
S-2149-8	S-2150-10	———	TWO
S-2149-9	S-2150-57	———	TWO
S-2149-10 *	S-2150-5	S-2150-48	TWO
S-2149-11 *	S-2150-10	S-2150-48	TWO
S-2149-12 *	S-2150-57	S-2150-48	TWO

ASSEMBLY NUMBERS OF SIGNS
(FOR READY REFERENCE)

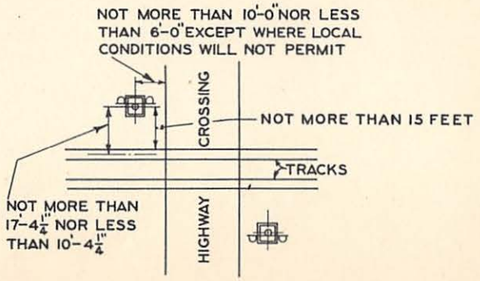
RAILROAD CROSSING, CAST IRON _____ S-2150-5

" " REFLECTOR ONE SIDE ONLY _____ S-2150-57

" " REFLECTOR ONE SIDE, EMBOSSED ENAMELED ONLY OTHER SIDE _____ S-2150-10

2 TRACKS, REFLECTOR _____ S-2150-48

* FOR TWO OR MORE TRACKS


NOT MORE THAN 10'-0" NOR LESS THAN 6'-0" EXCEPT WHERE LOCAL CONDITIONS WILL NOT PERMIT
CROSSING
NOT MORE THAN 15 FEET
TRACKS
HIGHWAY
NOT MORE THAN 17-4¼" NOR LESS THAN 10'-4¼"

LOCATION DIAGRAM

SEE NOTE 1

NO SCALE

NOTES

1. IN CASES WHERE PHYSICAL CHARACTERISTICS REQUIRE THAT EITHER OR BOTH SIGNALS SHALL BE LOCATED ON THE LEFT SIDE OF HIGHWAY, SUCH LOCATION MAY BE USED AFTER SPECIAL PERMISSION THEREFOR HAS BEEN SECURED FROM THE PUBLIC SERVICE COMMISSION.
2. PAINTING,—THE LAMP CASE, HOOD, AND BACKGROUND OF FLASHER UNITS SHALL BE PAINTED BLACK. ALL OTHER PARTS SHALL BE PAINTED WHITE EXCEPT LETTERED SIGNS SHALL BE PAINTED IN ACCORDANCE WITH DETAIL DRAWINGS. ALL PARTS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER. THE FINISHING COAT SHALL BE APPLIED IN THE FIELD.
3. EITHER A PAINTED OR REFLECTOR SIGN MAY BE USED FOR THE RAILROAD CROSSING SIGN.
4. MATERIAL AND DESIGN OF FLASHER UNITS AND JUNCTION BOX SHALL BE IN ACCORDANCE WITH PLAN APPROVED BY PURCHASER.
5. SIGNAL AND INSTALLATION MUST BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD REQUISITES S-1506, HIGHWAY CROSSING SIGNALS.
6. LOCATION PLANS OF PROPOSED INSTALLATION OF HIGHWAY CROSSING SIGNALS MUST BE SUBMITTED TO THE PUBLIC SERVICE COMMISSION FOR APPROVAL BEFORE INSTALLATION.

SCALE IN FEET

0 1 2 3 4

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
M. Cammaster
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
W. D. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
J. M. Davis
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A. J. Bowman
PRESIDENT

K.L.M.	W.S.E.	W.N.H.
K.L.M.		

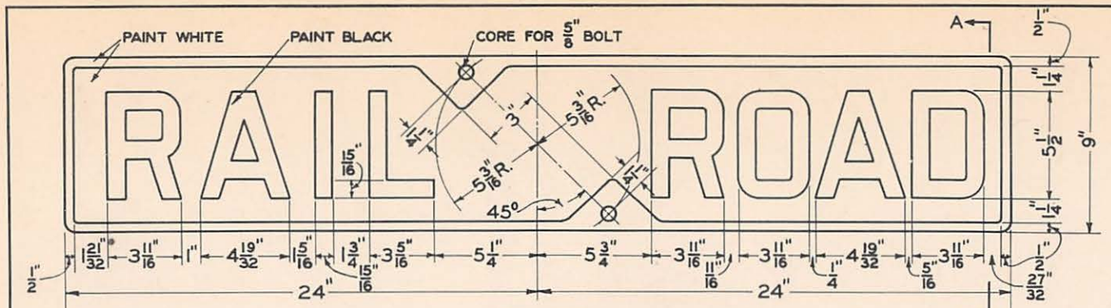
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

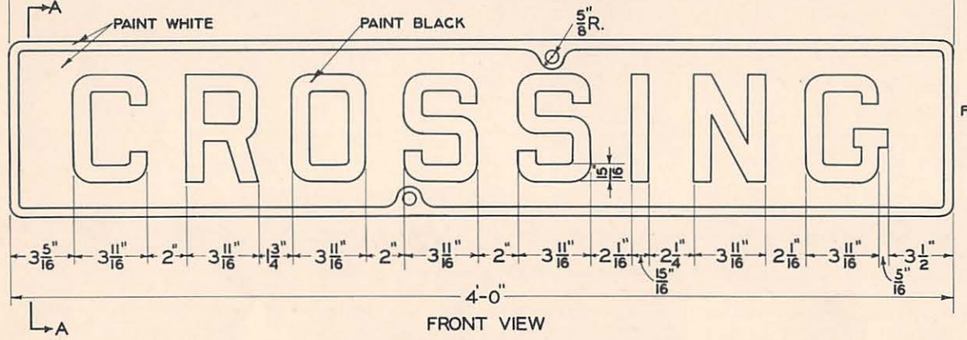
STANDARD HIGHWAY CROSSING SIGNAL

FOR USE IN NEW YORK

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
H. A. Wallace
CHAIRMAN
JUNE 28, 1944

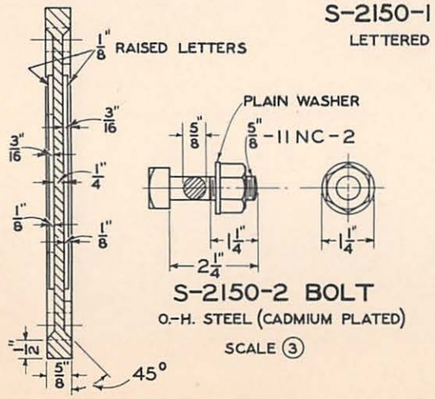
S-2149-A





S-2150-1 CROSSING SIGN ONLY

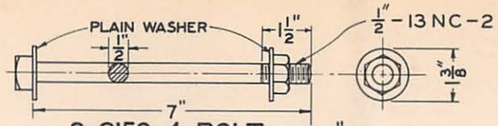
LETTERED ON BOTH SIDES AS SHOWN
CAST IRON
SCALE (1)



SECTION A-A
SCALE (3)

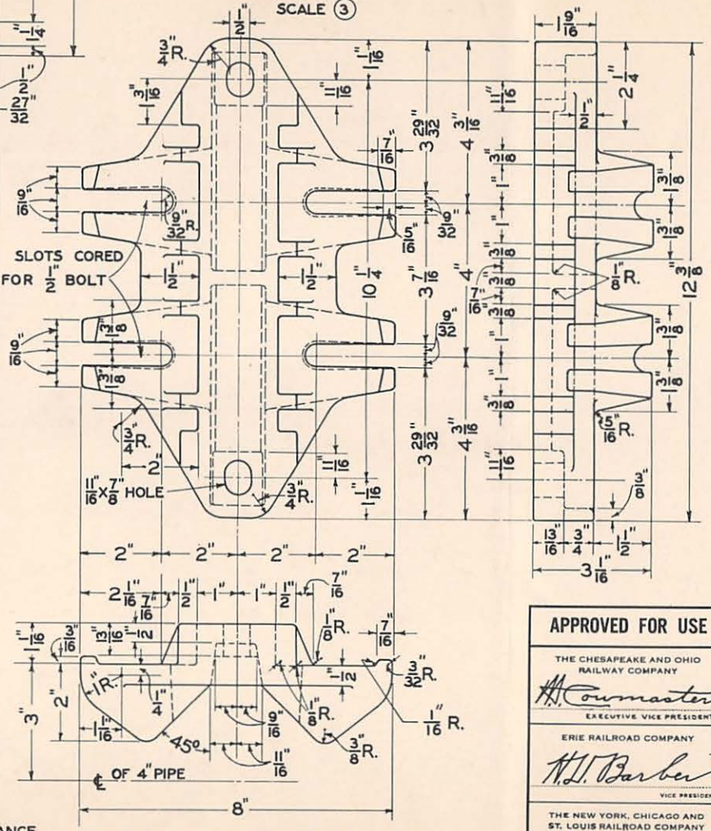
S-2150-2 BOLT

O.-H. STEEL (CADMIUM PLATED)
SCALE (3)



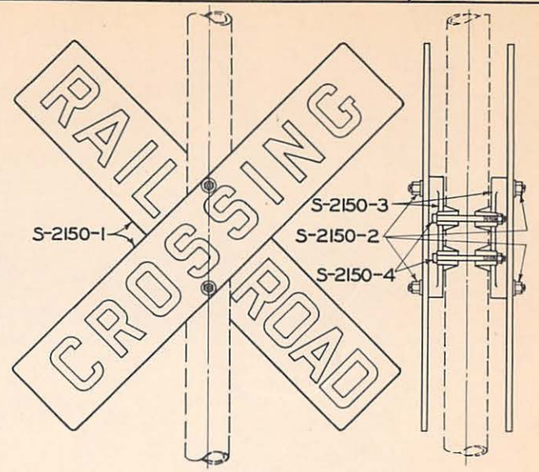
S-2150-4 BOLT FOR 4" PIPE

O.-H. STEEL
SCALE (3)



S-2150-3 ADAPTER CLAMP

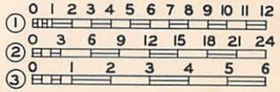
CAST IRON
SCALE (3)



S-2150-5 90° CAST IRON CROSSING SIGN

COMPLETE AS SHOWN
SCALE (2)

SCALE IN INCHES



NOTES

1. CROSSING SIGN AND ADAPTER CLAMP SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1552, RAILROAD HIGHWAY CROSSING SIGNAL SIGNS AND OTHER RAILROAD SIGNS.
2. PAINTING OF ADAPTER CLAMP SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. BOLTS SHALL HAVE A S A REGULAR SQUARE HEADS AND HEAVY HEXAGON NUTS.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H.T. Cournaster
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
W.J. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
V.D. Beale
VICE PRESIDENT

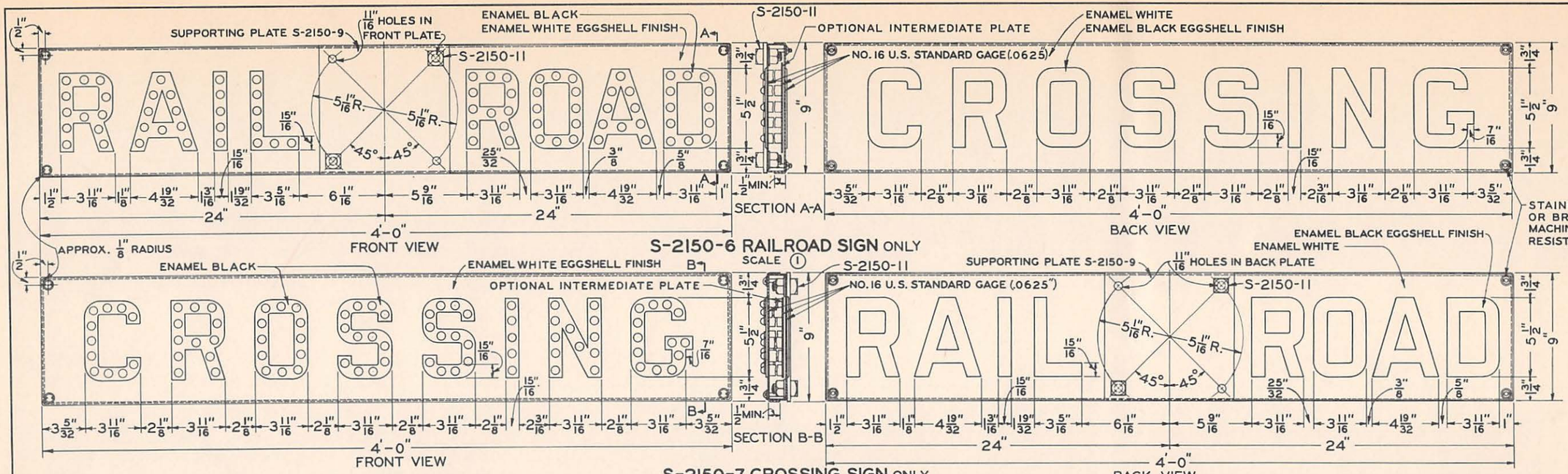
PERE MARQUETTE RAILWAY COMPANY
A.J. Brosman
PRESIDENT

C.H.W.	W.S.E.	W.N.H.
K.L.M.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

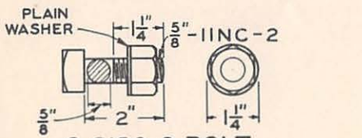
STANDARD RAILROAD HIGHWAY CROSSING SIGNAL SIGNS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
OCT. 18, 1943.
J. E. Wallace
CHAIRMAN

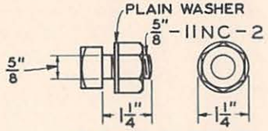


S-2150-6 RAILROAD SIGN ONLY
SCALE (1)

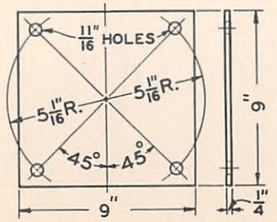
S-2150-7 CROSSING SIGN ONLY
SCALE (1)



S-2150-8 BOLT
O.-H. STEEL (CADMIUM PLATED)
SCALE (3)



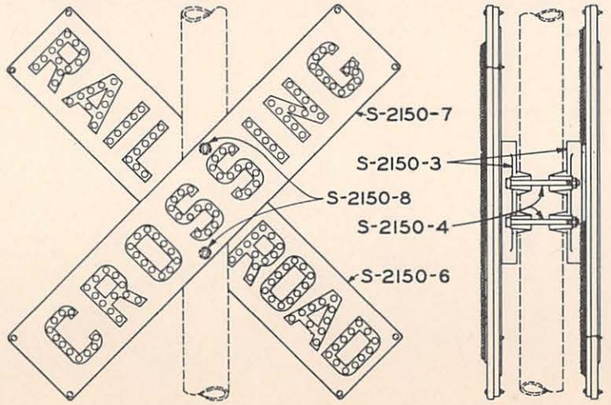
S-2150-11 BOLT
O.-H. STEEL (CADMIUM PLATED)
SCALE (3)



S-2150-9 SUPPORTING PLATE
O.-H. STEEL
SCALE (1)

NOTES

1. SIGNS AND REFLECTOR UNITS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1552, RAILROAD HIGHWAY CROSSING SIGNAL SIGNS AND OTHER RAILROAD SIGNS, AND STANDARD SPECIFICATIONS S-1551, COLORLESS REFLECTOR UNITS, RESPECTIVELY.
2. PAINTING OF SUPPORTING PLATE SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. NUMBER AND SPACING OF REFLECTOR UNITS SHALL BE AS SHOWN.
4. BOLTS SHALL HAVE A S A REGULAR SQUARE HEADS AND HEAVY HEXAGON NUTS.



S-2150-10 RAILROAD CROSSING SIGN COMPLETE AS SHOWN
SCALE (2)

SCALE IN INCHES
(1) 0 1 2 3 4 5 6 7 8 9 10 11 12
(2) 0 3 6 9 12 15 18 21 24
(3) 0 1 2 3 4 5 6

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H.A. Courmaster
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
N.D. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
V.D. Beale
VICE PRESIDENT

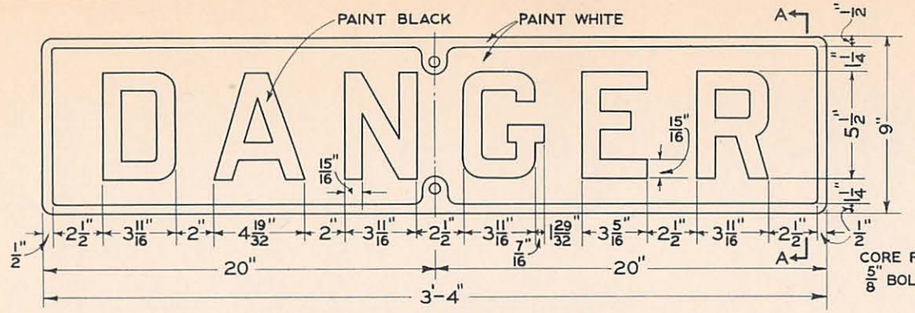
PERE MARQUETTE RAILWAY COMPANY
A.J. Brownmar
PRESIDENT

C.H.W.	W.S.E.	W.N.H.
C.B.P.		

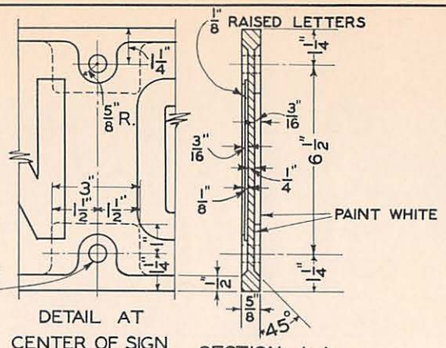
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD RAILROAD HIGHWAY CROSSING SIGNAL SIGNS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
OCT. 18, 1943.
J. Wallace
CHAIRMAN



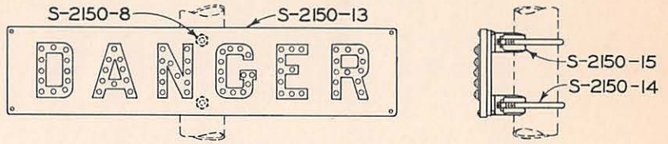
S-2150-12 DANGER SIGN ONLY



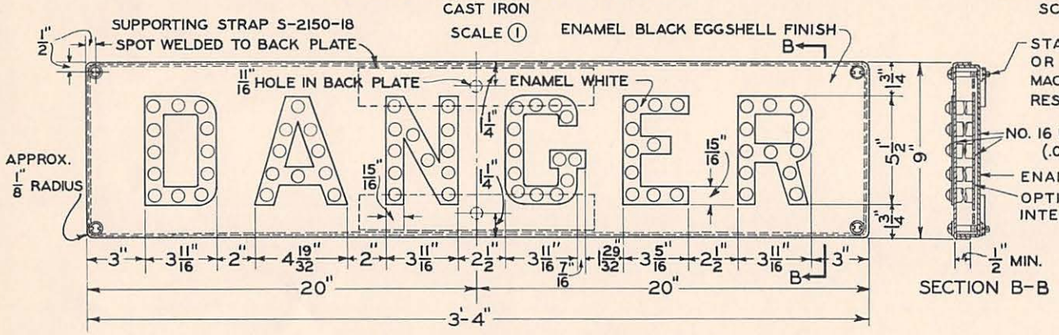
DETAIL AT CENTER OF SIGN
SCALE ②

SECTION A-A
SCALE ②

S-2150-16 DANGER SIGN COMPLETE AS SHOWN
SCALE ③



S-2150-17 DANGER SIGN COMPLETE AS SHOWN
SCALE ③

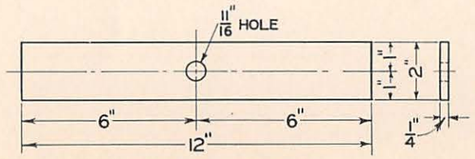


S-2150-13 DANGER SIGN ONLY
SCALE ①
NUMBER AND SPACING OF REFLECTOR UNITS SHALL BE AS SHOWN

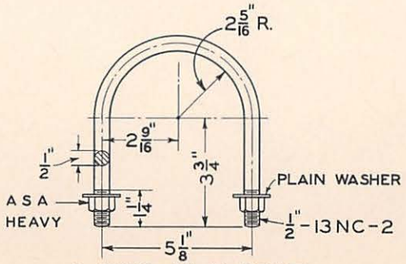
NOTES

1. SIGNS AND ADAPTER CLAMP SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1552, RAILROAD HIGHWAY CROSSING SIGNAL SIGNS AND OTHER RAILROAD SIGNS. REFLECTOR UNITS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1551, COLORLESS REFLECTOR UNITS.
2. PAINTING OF ADAPTER CLAMP SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

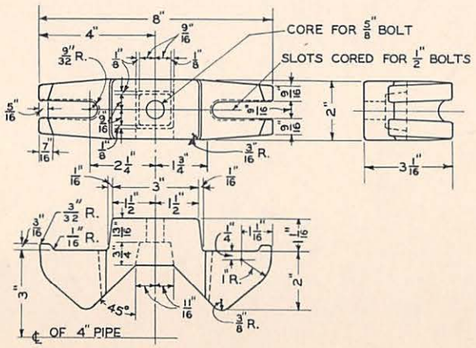
SCALE IN INCHES
① 0 1 2 3 4 5 6 7 8 9 10 11 12
② 0 1 2 3 4 5 6 7 8
③ 0 3 6 9 12 15 18 21 24



S-2150-18 STRAP
O.-H. STEEL
SCALE ②



S-2150-14 U BOLT
FOR 4" PIPE
O.-H. STEEL
SCALE ②



S-2150-15 ADAPTER CLAMP
CAST IRON
SCALE ②

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H.H. Cowmaster
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
W.D. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
V.D. Beale
VICE PRESIDENT

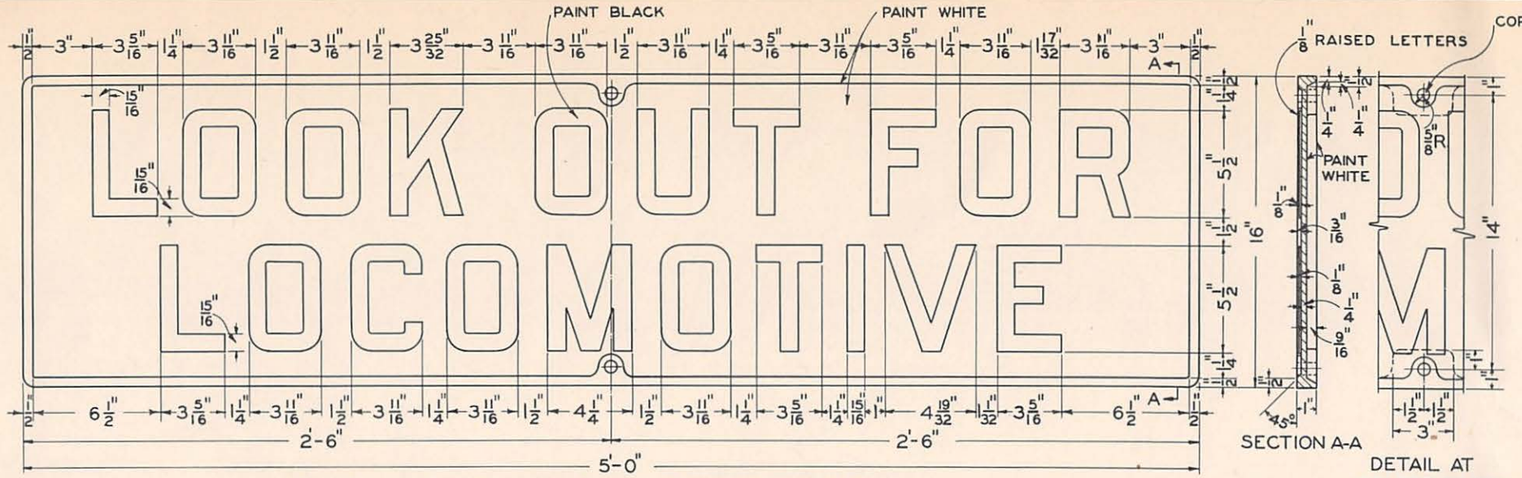
PERE MARQUETTE RAILWAY COMPAN.
R.H. Bowman
PRESIDENT

C.H.W.	W.S.E.	W.N.H.
K.L.M.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD RAILROAD HIGHWAY CROSSING SIGNAL SIGNS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. Wallace
CHAIRMAN
OCT. 18, 1943.



S-2150-24 LOOK OUT FOR LOCOMOTIVE SIGN ONLY

DETAIL AT CENTER OF SIGN
SCALE (1)

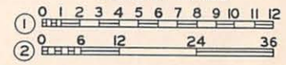
S-2150-26 LOOK OUT FOR LOCOMOTIVE SIGN
COMPLETE AS SHOWN
SCALE (2)

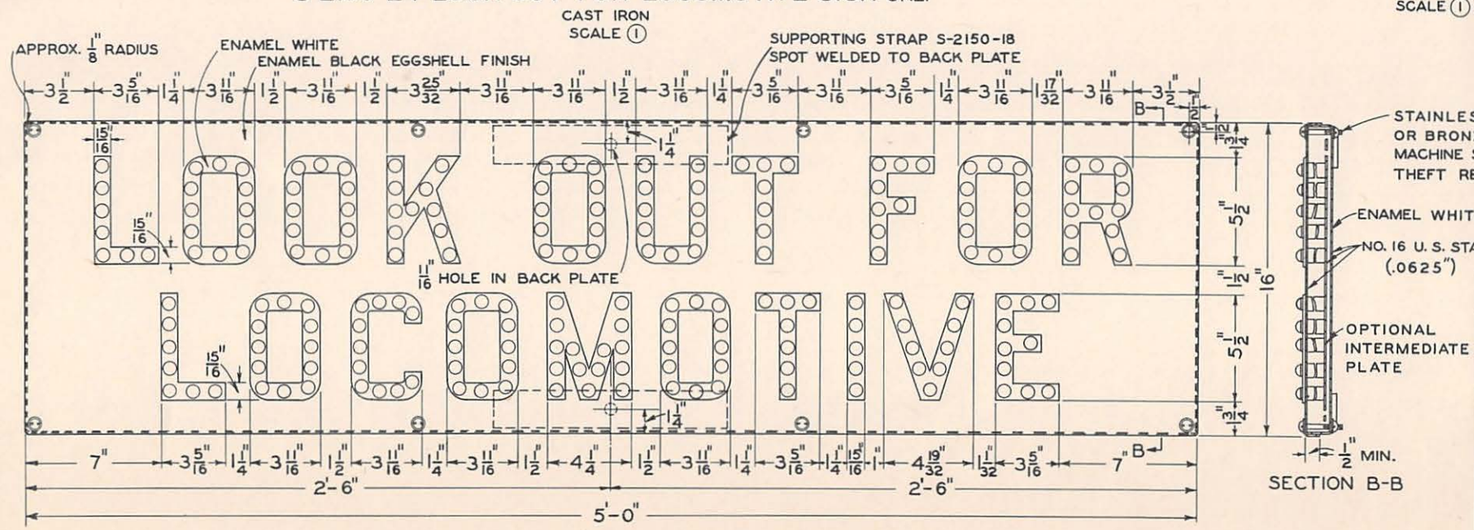
S-2150-27 LOOK OUT FOR LOCOMOTIVE SIGN
COMPLETE AS SHOWN
SCALE (2)

NOTE

SIGNS AND REFLECTOR UNITS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1552, RAILROAD HIGHWAY CROSSING SIGNAL SIGNS AND OTHER RAILROAD SIGNS, AND STANDARD SPECIFICATIONS S-1551, COLORLESS REFLECTOR UNITS, RESPECTIVELY.

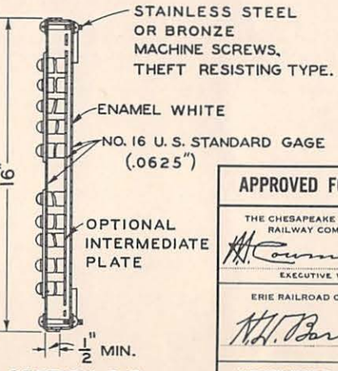
SCALE IN INCHES





S-2150-25 LOOK OUT FOR LOCOMOTIVE SIGN ONLY
SCALE (1)

NUMBER AND SPACING OF REFLECTOR UNITS SHALL BE AS SHOWN


STAINLESS STEEL OR BRONZE MACHINE SCREWS, THEFT RESISTING TYPE.
ENAMEL WHITE
NO. 16 U. S. STANDARD GAGE (.0625")
OPTIONAL INTERMEDIATE PLATE
1/2" MIN.
SECTION B-B

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
PRESIDENT

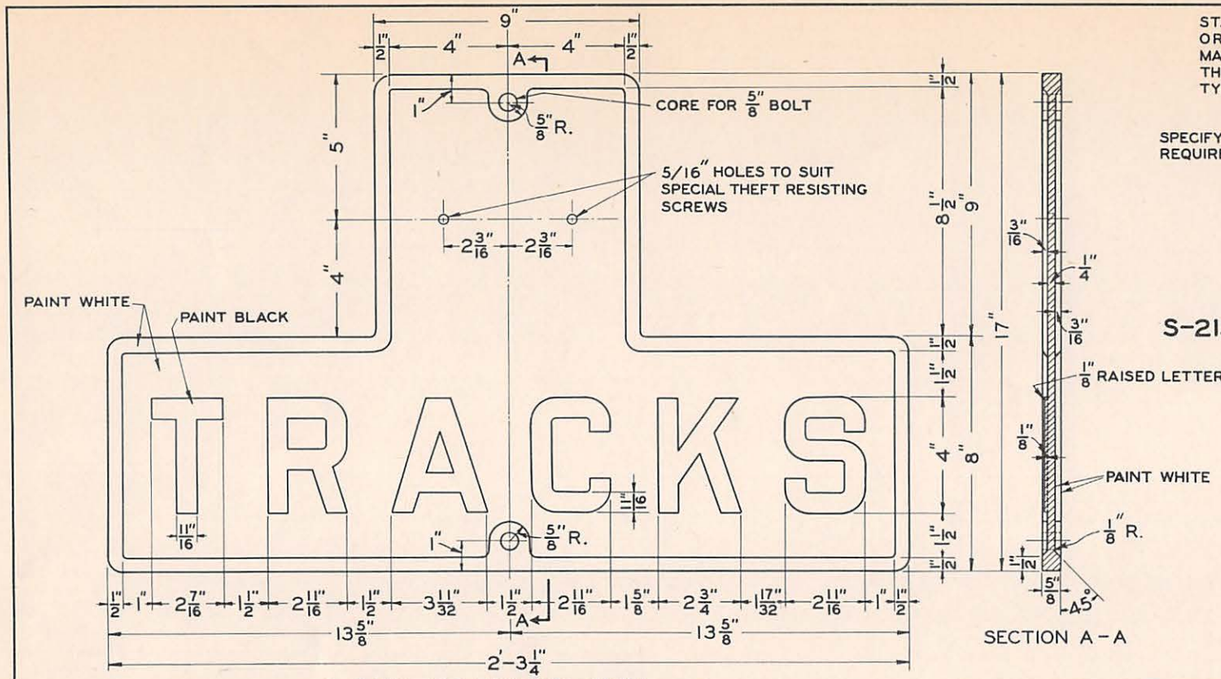
C.H.W. | C.H.W. | W.S.E. | W.N.H.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

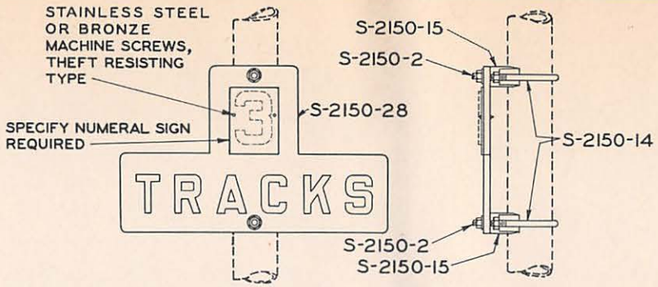
STANDARD RAILROAD HIGHWAY CROSSING SIGNAL SIGNS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
OCT. 18, 1943.
CHAIRMAN

SHEET 5 OF 10
S-2150-B



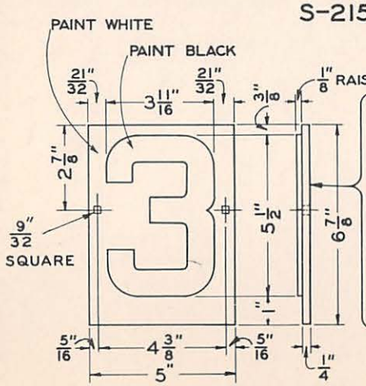
S-2150-28 TRACKS SIGN ONLY
CAST IRON
SCALE (1)



S-2150-29 TRACKS SIGN COMPLETE WITH NUMERAL SIGN
SPECIFY NUMERAL SIGN REQUIRED
SCALE (2)

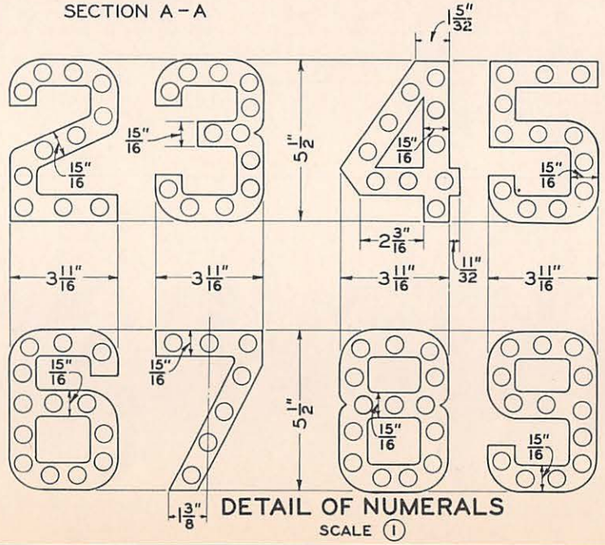
NOTES

1. OUTLINES OF NUMERALS FOR REFLECTOR TRACKS SIGN AND CAST IRON TRACKS SIGN ARE IDENTICAL.
2. NUMBER AND SPACING OF REFLECTOR UNITS WHEN USED IN NUMERAL SIGNS SHALL BE AS SHOWN.
3. TRACKS SIGN SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1552, RAILROAD HIGHWAY CROSSING SIGNAL SIGNS AND OTHER RAILROAD SIGNS.



S-2150-30	NUMERAL SIGN	WITH	FIGURE	2
S-2150-31	"	"	"	3
S-2150-32	"	"	"	4
S-2150-33	"	"	"	5
S-2150-34	"	"	"	6
S-2150-35	"	"	"	7
S-2150-36	"	"	"	8
S-2150-37	"	"	"	9

DETAIL OF NUMERAL SIGN
CAST IRON
SCALE (1)



DETAIL OF NUMERALS
SCALE (1)

SCALE IN INCHES
(1) 0 1 2 3 4 5 6 7 8
(2) 0 3 6 9 12 15 18 21 24

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H.H. Courmaster
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
W.L. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
V.D. Beale
VICE PRESIDENT

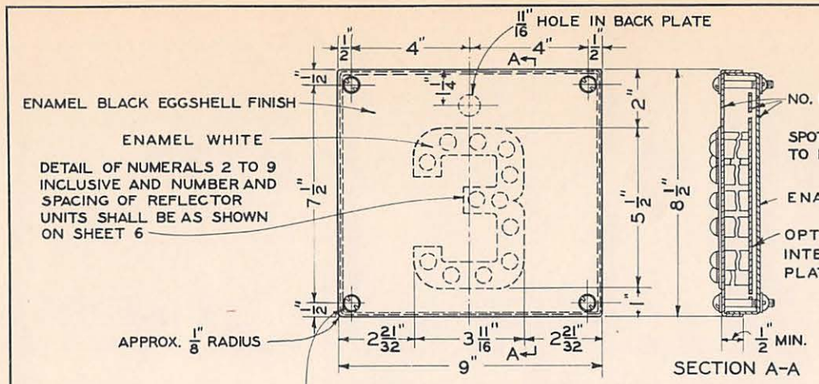
PERE MARQUETTE RAILWAY COMPANY
A.H. Browman
PRESIDENT

C.H.W.	W.S.E.	W.N.H.
K.L.M.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD RAILROAD HIGHWAY CROSSING SIGNAL SIGNS

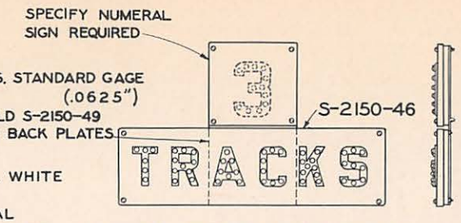
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. E. Wallace
CHAIRMAN
OCT. 18, 1943.



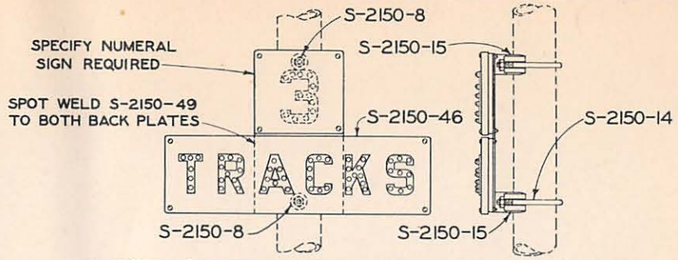
S-2150-38 NUMERAL SIGN WITH FIGURE 2
S-2150-39 " " " " 3
S-2150-40 " " " " 4
S-2150-41 " " " " 5
S-2150-42 " " " " 6
S-2150-43 " " " " 7
S-2150-44 " " " " 8
S-2150-45 " " " " 9

SCALE (1)

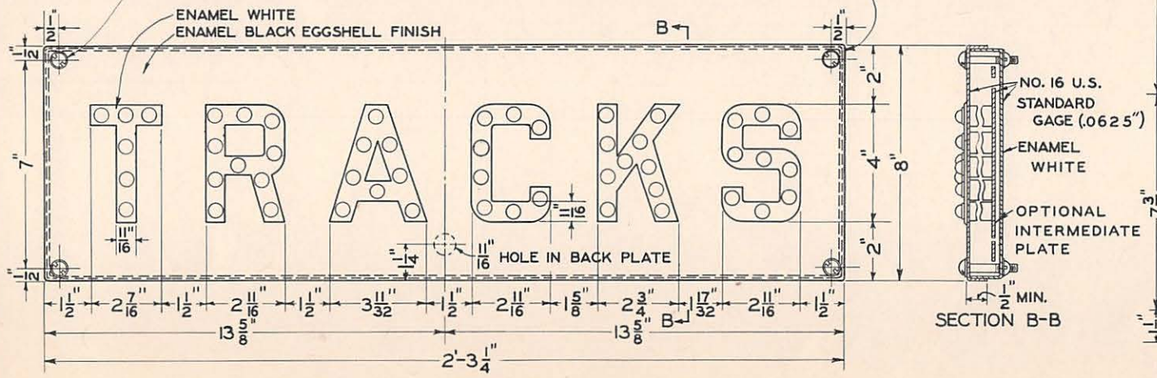
STAINLESS STEEL OR BRONZE MACHINE SCREWS, THEFT RESISTING TYPE



S-2150-47 TRACKS SIGN WITH NUMERAL SIGN
SPECIFY NUMERAL SIGN REQUIRED
SCALE (2)

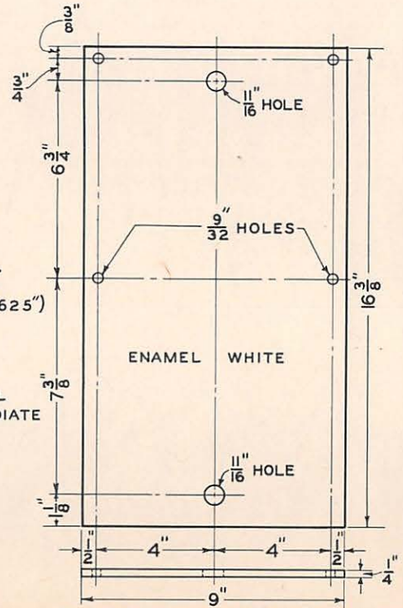


S-2150-48 TRACKS SIGN COMPLETE WITH NUMERAL SIGN
SPECIFY NUMERAL SIGN REQUIRED
SCALE (2)



S-2150-46 TRACKS SIGN ONLY
SCALE (1)

NUMBER AND SPACING OF REFLECTOR UNITS SHALL BE AS SHOWN.



S-2150-49 SUPPORTING PLATE
O.-H. STEEL
SCALE (1)

NOTE

SIGNS AND REFLECTOR UNITS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1552, RAILROAD HIGHWAY CROSSING SIGNAL SIGNS AND OTHER RAILROAD SIGNS, AND STANDARD SPECIFICATIONS S-1551, COLORLESS REFLECTOR UNITS, RESPECTIVELY.

SCALE IN INCHES
(1) 0 1 2 3 4 5 6 7 8
(2) 0 3 6 9 12 15 18 21 24

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H.W. Coumaster
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
N.D. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
V.D. Beale
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
J.H. Bowman
PRESIDENT

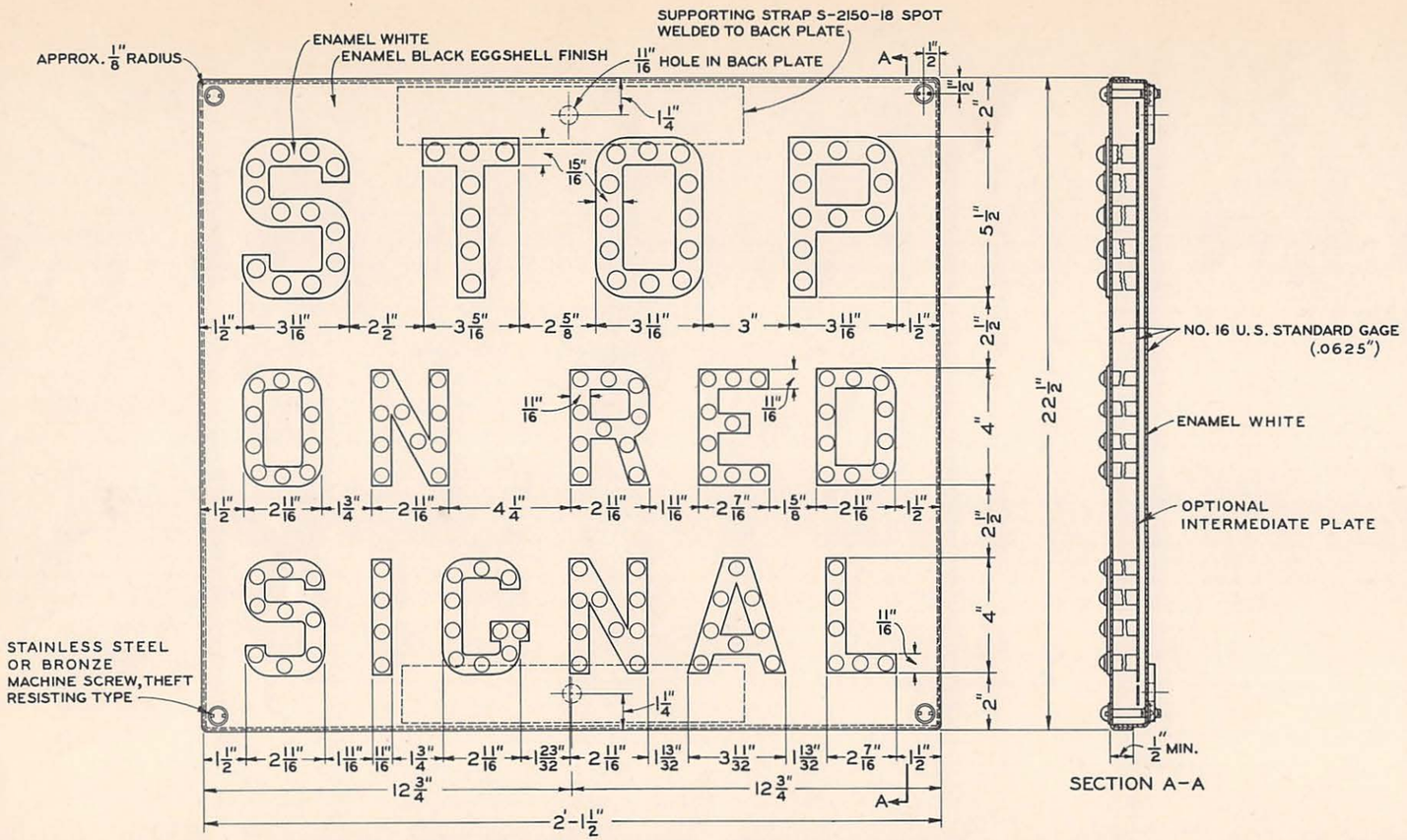
C.H.W. | W.S.E. | W.N.H.
K.L.M.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD RAILROAD HIGHWAY CROSSING SIGNAL SIGNS

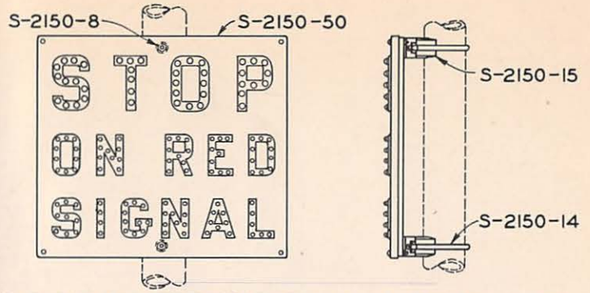
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
J. C. Wallace
CHAIRMAN
OCT. 18, 1943.

SHEET 7 OF 10
S-2150-B


APPROX. 1/8" RADIUS
ENAMEL WHITE
ENAMEL BLACK EGGSHELL FINISH
SUPPORTING STRAP S-2150-18 SPOT WELDED TO BACK PLATE
11/16" HOLE IN BACK PLATE
1 1/4"
15/16"
STOP
ON RED
SIGNAL
11/16"
STAINLESS STEEL OR BRONZE MACHINE SCREW, THEFT RESISTING TYPE
1 1/2" 3 11/16" 2 1/2" 3 5/16" 2 5/8" 3 11/16" 3" 3 11/16" 1 1/2"
1 1/2" 2 11/16" 1 3/4" 2 11/16" 4 1/4" 2 11/16" 1 11/16" 2 7/16" 1 5/8" 2 11/16" 1 1/2"
1 1/2" 2 11/16" 1 11/16" 11/16" 1 3/4" 2 11/16" 1 23/32" 2 11/16" 1 13/32" 3 11/32" 1 13/32" 2 7/16" 1 1/2"
12 3/4"
12 3/4"
2'-1 1/2"
A
1/2"
2"
5 1/2"
2 1/2"
4"
2 1/2"
4"
2"
22 1/2"
NO. 16 U.S. STANDARD GAGE (.0625")
ENAMEL WHITE
OPTIONAL INTERMEDIATE PLATE
1/2" MIN.
SECTION A-A

S-2150-50 STOP ON RED SIGNAL SIGN ONLY
SCALE ①

NUMBER AND SPACING OF REFLECTOR UNITS SHALL BE AS SHOWN



S-2150-51 STOP ON RED SIGNAL SIGN COMPLETE AS SHOWN
SCALE ②

NOTE

SIGN AND REFLECTOR UNITS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1552, RAILROAD HIGHWAY CROSSING SIGNAL SIGNS AND OTHER RAILROAD SIGNS, AND STANDARD SPECIFICATIONS S-1551, COLORLESS REFLECTOR UNITS, RESPECTIVELY.

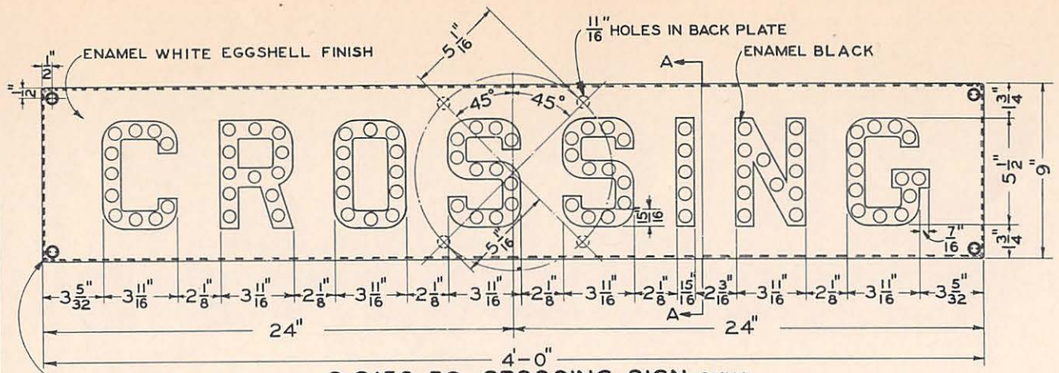
SCALE IN INCHES
① 0 1 2 3 4 5 6 7 8
② 0 3 6 9 12 15 18 21 24

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY H.N. Cournaster EXECUTIVE VICE PRESIDENT		
ERIE RAILROAD COMPANY N.D. Barber VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY V.D. Beale VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY A.J. Bowman PRESIDENT		
C.H.W. C.B.P.	W.S.E.	W.N.H.

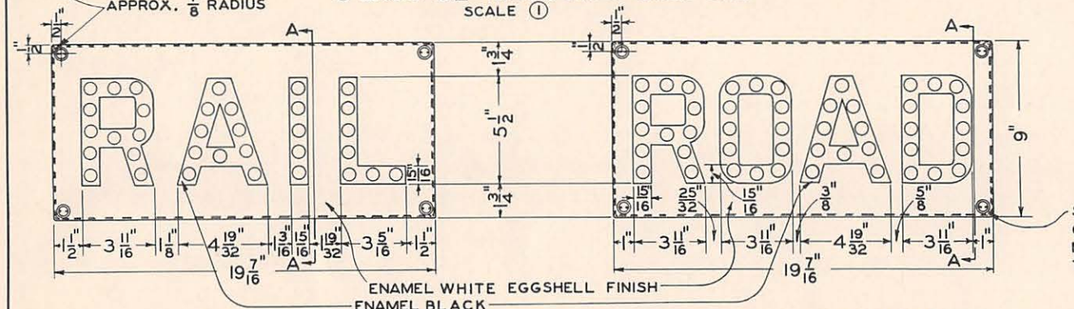
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD RAILROAD HIGHWAY CROSSING SIGNAL SIGNS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
OCT. 18, 1943.
H. Wallace
CHAIRMAN



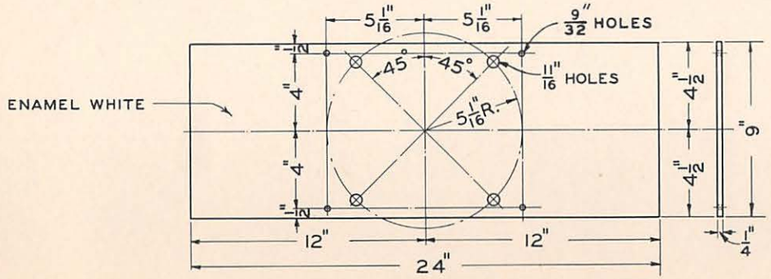
S-2150-52 CROSSING SIGN ONLY
SCALE ①



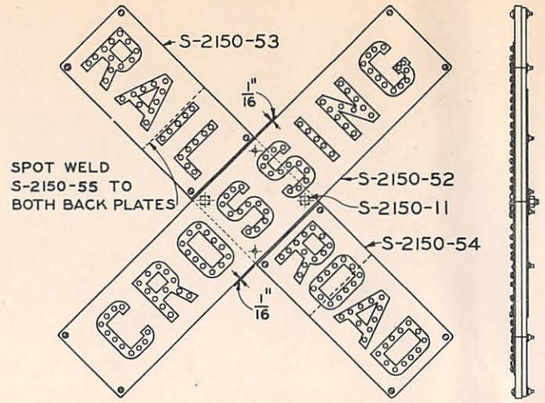
S-2150-53 RAIL SIGN ONLY
SCALE ①

S-2150-54 ROAD SIGN ONLY
SCALE ①

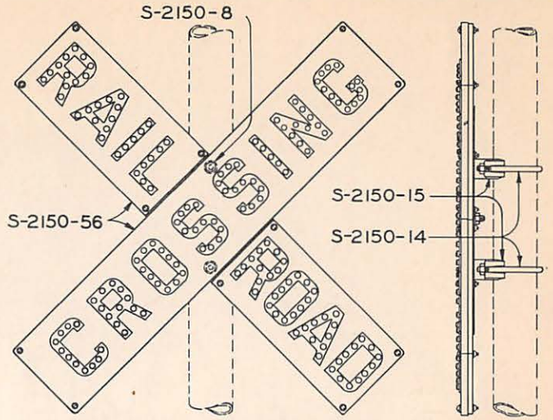
STAINLESS STEEL OR BRONZE MACHINE SCREWS, THEFT RESISTING TYPE



S-2150-55 SUPPORTING PLATE
O-H. STEEL
SCALE ①



S-2150-56 RAILROAD CROSSING SIGN ONLY
SCALE ②

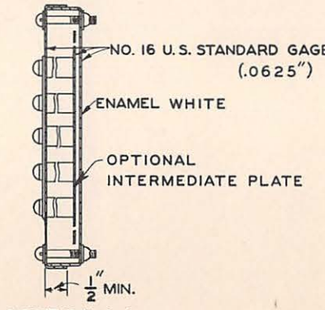


S-2150-57 RAILROAD CROSSING SIGN
COMPLETE AS SHOWN
SCALE ②

NOTES

1. SIGNS AND REFLECTOR UNITS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1552, RAILROAD HIGHWAY CROSSING SIGNAL SIGNS AND OTHER RAILROAD SIGNS, AND STANDARD SPECIFICATIONS S-1551, COLORLESS REFLECTOR UNITS, RESPECTIVELY.
2. NUMBER AND SPACING OF REFLECTOR UNITS SHALL BE AS SHOWN.

SCALE IN INCHES
① 0 1 2 4 6 8 10 12
② 0 3 6 9 12 15 18 21 24
③ 0 1 2 3 4 5 6 7 8



SECTION A-A
SCALE ③

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

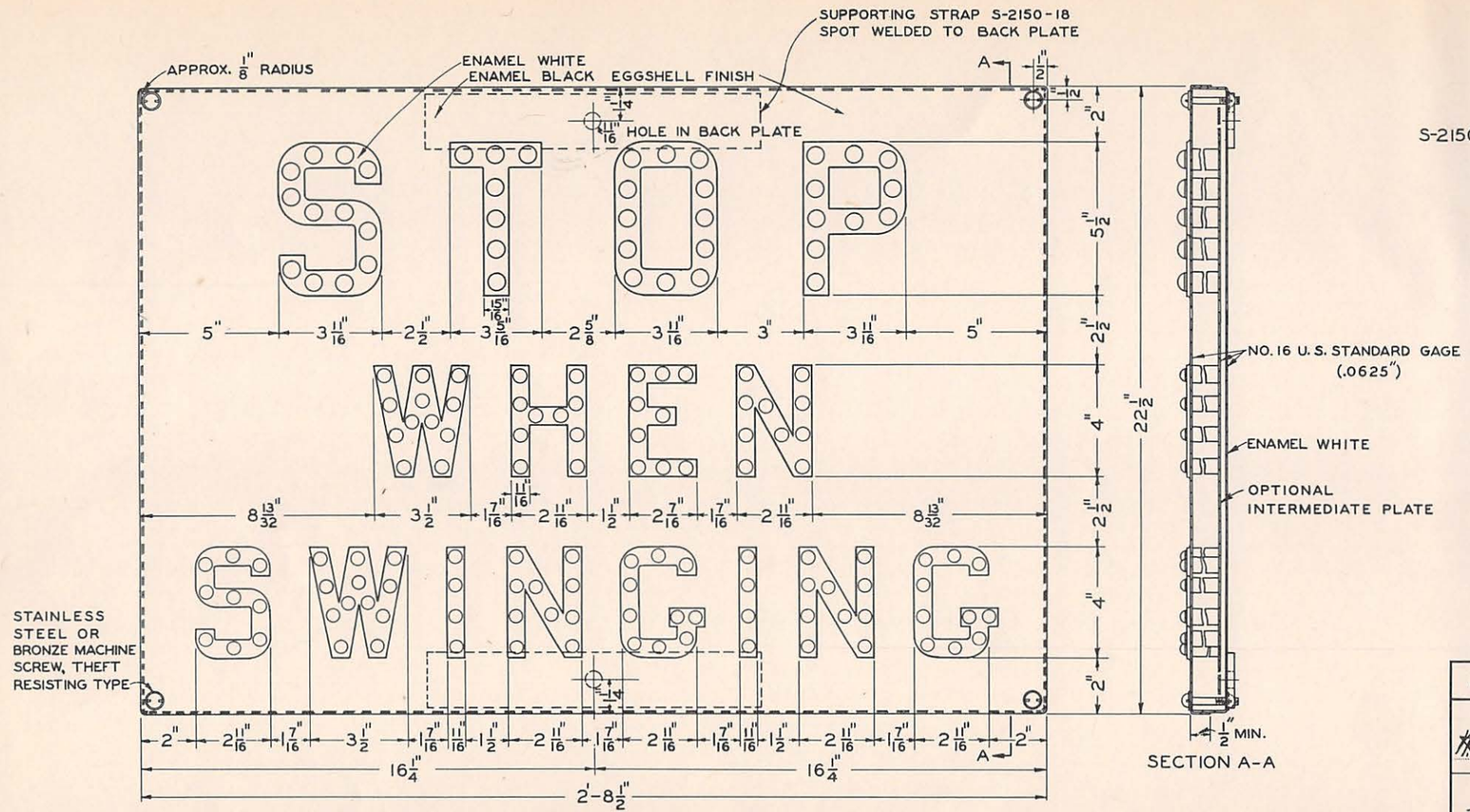
PERE MARQUETTE RAILWAY COMPANY
PRESIDENT

C.H.W.	W.S.E.	W.N.H.
C.H.W.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

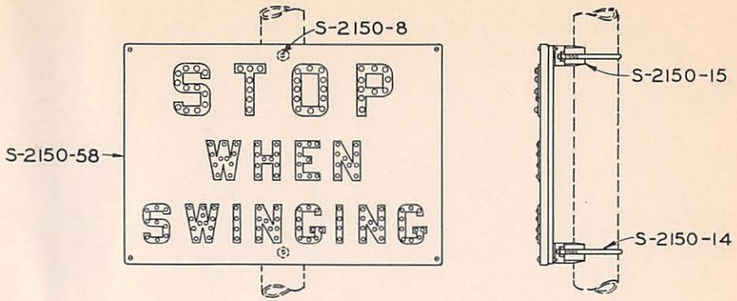
STANDARD HIGHWAY CROSSING SIGNAL SIGNS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
OCT. 18, 1943.
CHAIRMAN



S-2150-58 STOP WHEN SWINGING SIGN ONLY
SCALE ①

NUMBER AND SPACING OF REFLECTOR UNITS SHALL BE AS SHOWN



S-2150-59 STOP WHEN SWINGING SIGN
COMPLETE AS SHOWN
SCALE ②

NOTE
SIGN AND REFLECTOR UNITS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1552, RAILROAD HIGHWAY CROSSING SIGNAL SIGNS AND OTHER RAILROAD SIGNS, AND STANDARD SPECIFICATIONS S-1551, COLORLESS REFLECTOR UNITS, RESPECTIVELY.

SCALE IN INCHES
① 0 1 2 3 4 5 6 7 8
② 0 3 6 9 12 15 18 21 24

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H. A. Townsend
EXECUTIVE VICE PRESIDENT

ERIE RAILROAD COMPANY
H. W. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
V. D. Beale
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A. J. Bowman
PRESIDENT

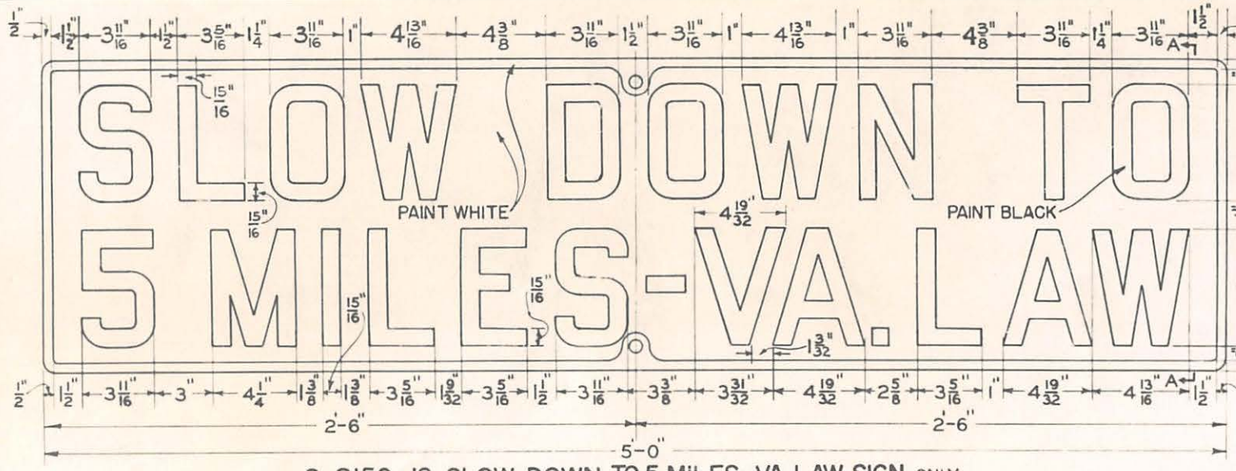
C.H.W.	W.S.E.	W.N.H.
C.H.W.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

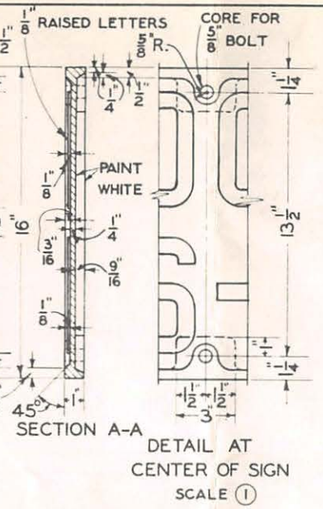
STANDARD RAILROAD HIGHWAY CROSSING SIGNAL SIGNS

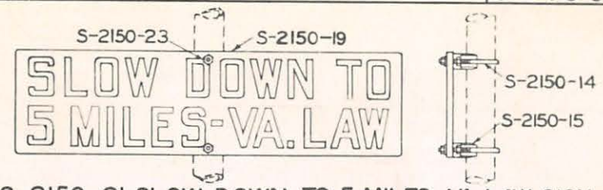
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
OCT. 18, 1943.
J. E. Wallace
CHAIRMAN

SHEET 10 OF 10
S-2150-B

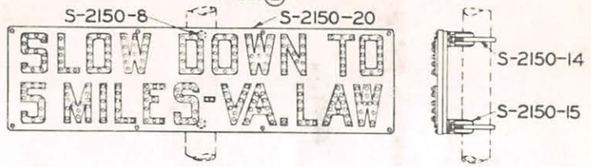


S-2150-19 SLOW DOWN TO 5 MILES-VA. LAW SIGN ONLY

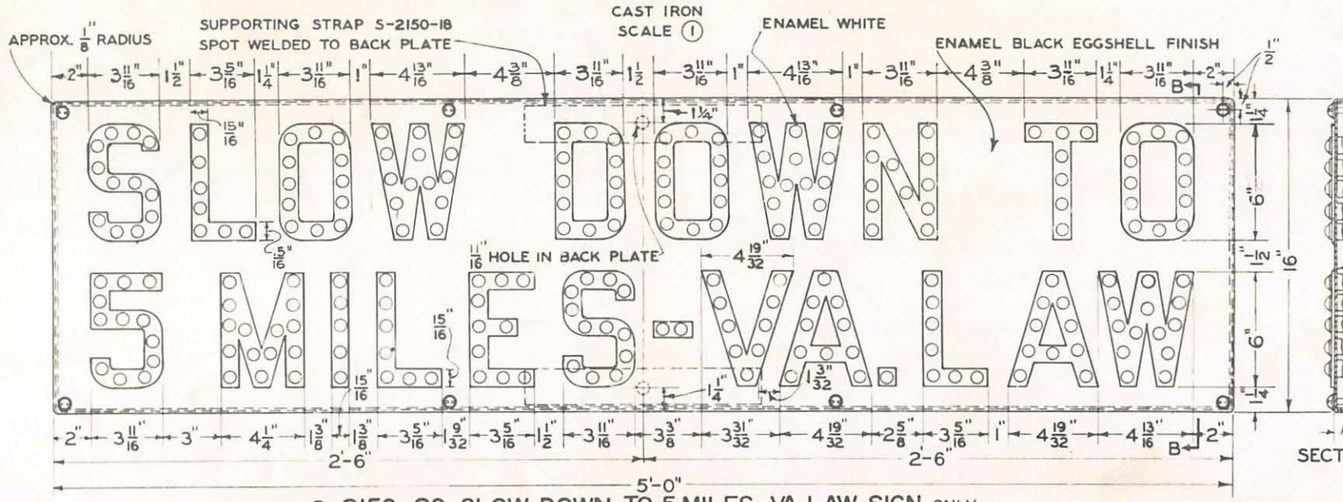




S-2150-21 SLOW DOWN TO 5 MILES-VA. LAW SIGN
COMPLETE AS SHOWN
SCALE (2)

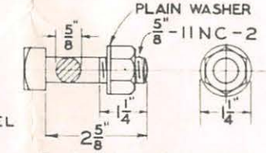


S-2150-22 SLOW DOWN TO 5 MILES-VA. LAW SIGN
COMPLETE AS SHOWN
SCALE (2)



S-2150-20 SLOW DOWN TO 5 MILES-VA. LAW SIGN ONLY
SCALE (1)

NUMBER AND SPACING OF REFLECTOR UNITS SHALL BE AS SHOWN

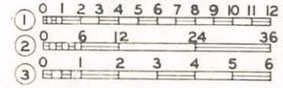


S-2150-23 BOLT
O-H. STEEL (CADMIUM PLATED)
SCALE (3)

NOTES

1. SIGNS AND REFLECTOR UNITS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1552, RAILROAD HIGHWAY CROSSING SIGNAL SIGNS AND OTHER RAILROAD SIGNS, AND STANDARD SPECIFICATIONS S-1551, COLORLESS REFLECTOR UNITS, RESPECTIVELY.
2. BOLTS SHALL HAVE AS A REGULAR SQUARE HEADS AND HEAVY HEXAGON NUTS.

SCALE IN INCHES



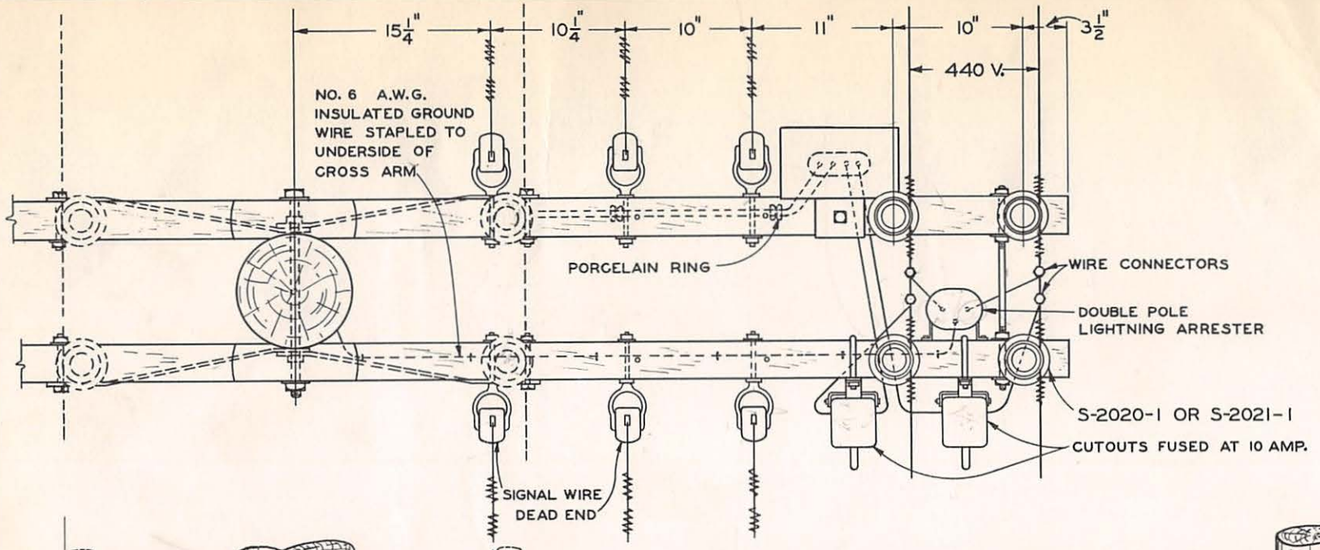
REVISIONS
5-31-1950

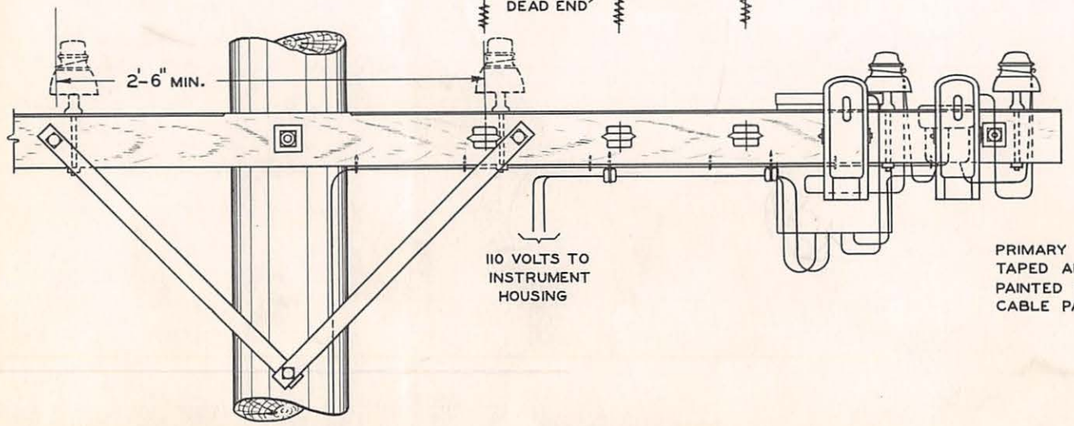
D.H.	J.H.A.	T.L.C.
D.H.		

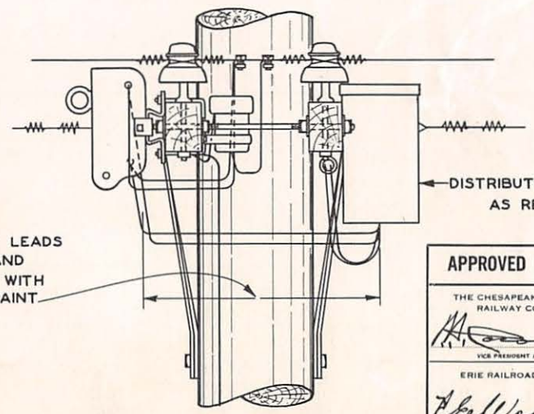
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
CHESAPEAKE DISTRICT
OFFICE SUPERINTENDENT TELEGRAPH AND SIGNALS RICHMOND VIRGINIA

STANDARD RAILROAD HIGHWAY CROSSING SIGNAL SIGNS

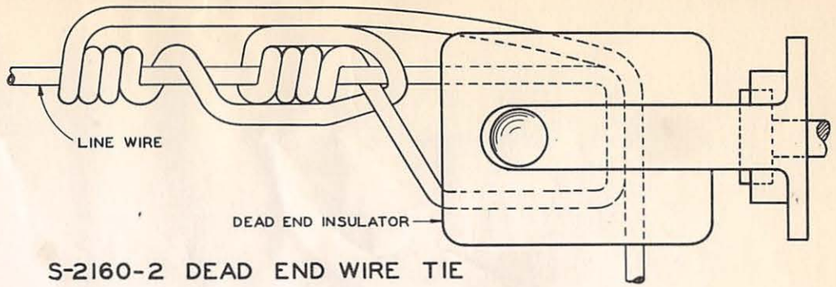
APPROVED W. A. Eastman
SUPT. TELEGRAPH AND SIGNALS
OCT. 18, 1943.







S-2160-1 TRANSFORMER LAYOUT WITH POWER TAP



S-2160-2 DEAD END WIRE TIE

NO SCALE

SCALE IN INCHES
0 3 6 9 12 15 18

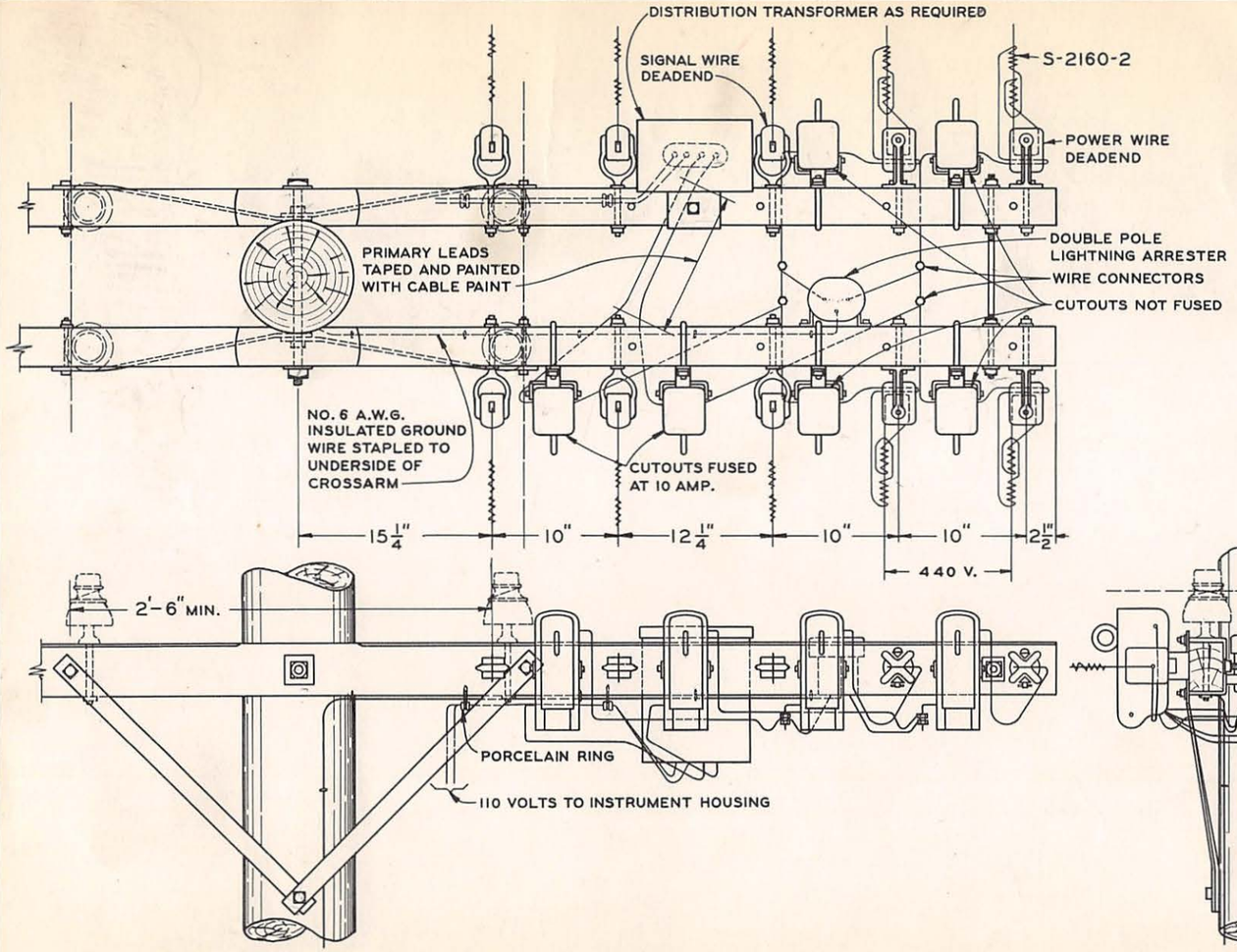
APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT AND GENERAL MANAGER		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — EXECUTIVE VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT		
C.H.W.	C.D.M.	A.J.P.
C.H.W.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

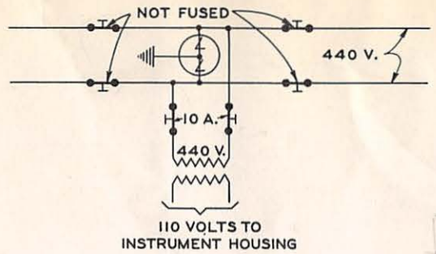
STANDARD

LAYOUT FOR TRANSFORMER CONNECTIONS ON 440 VOLT SIGNAL POWER LINE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: MAR. 15, 1937
CHIEF ENGINEER



S-2160-3 TRANSFORMER LAYOUT WITH SECTIONALIZING ARRANGEMENT



SCHEMATIC WIRING PLAN
NO SCALE

SCALE IN INCHES
0 3 6 9 12 15 18

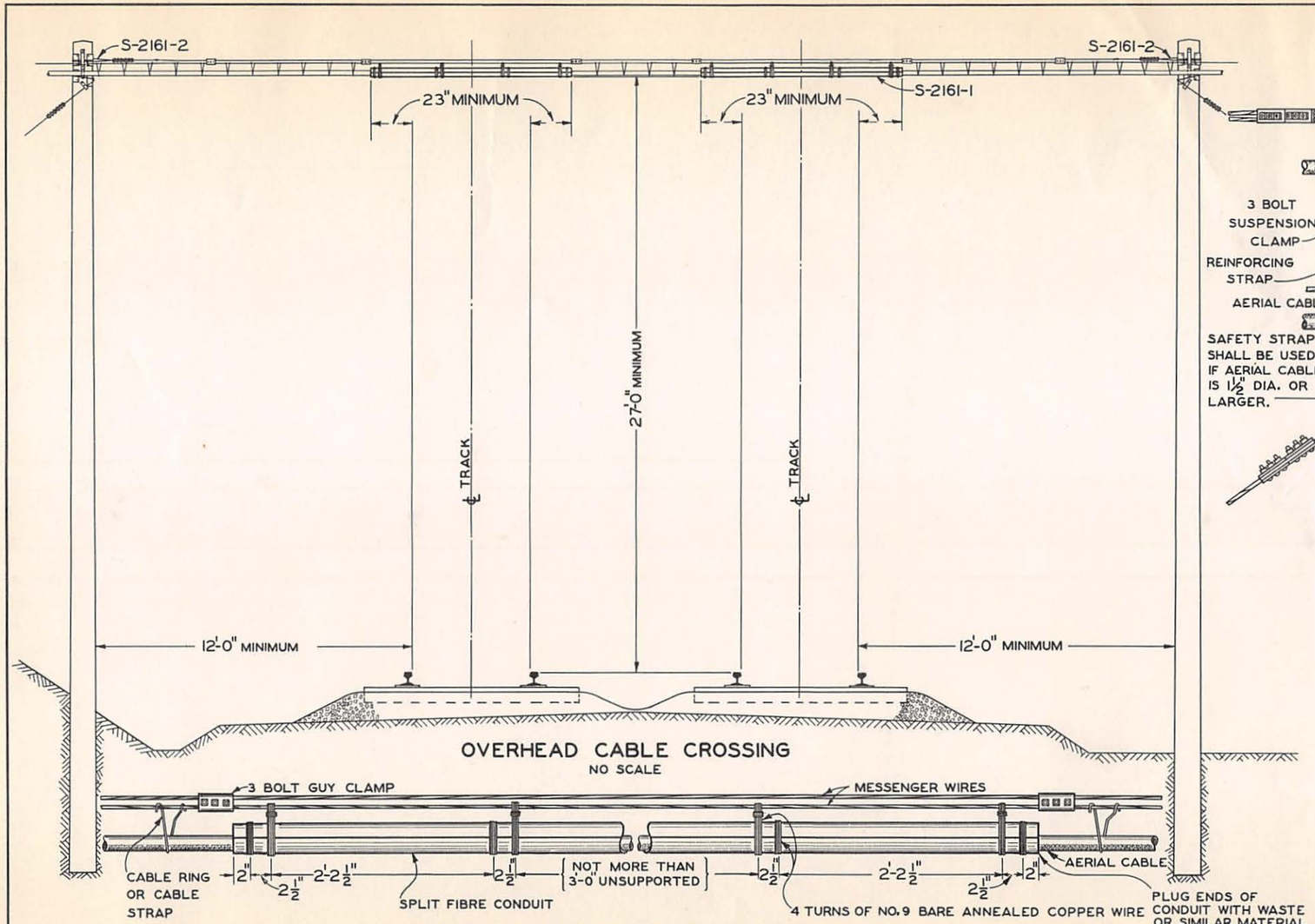
APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY VICE PRESIDENT AND GENERAL MANAGER		
ERIE RAILROAD COMPANY VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY EXECUTIVE VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY VICE PRESIDENT		
C. H. W.	C. D. M.	A. J. P.
C. B. P.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

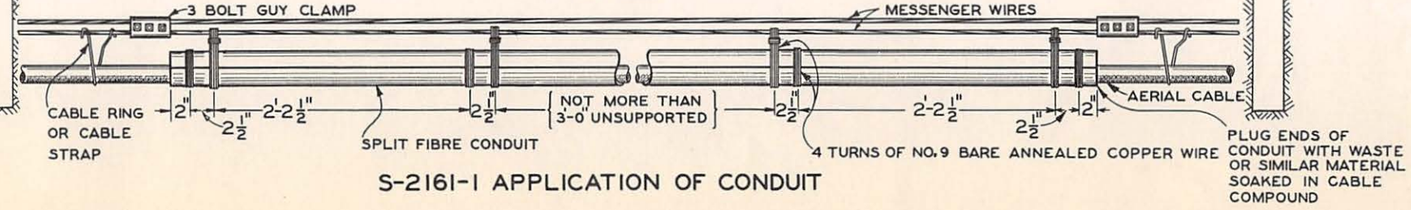
STANDARD

LAYOUT FOR TRANSFORMER CONNECTIONS ON 440 VOLT SIGNAL POWER LINE

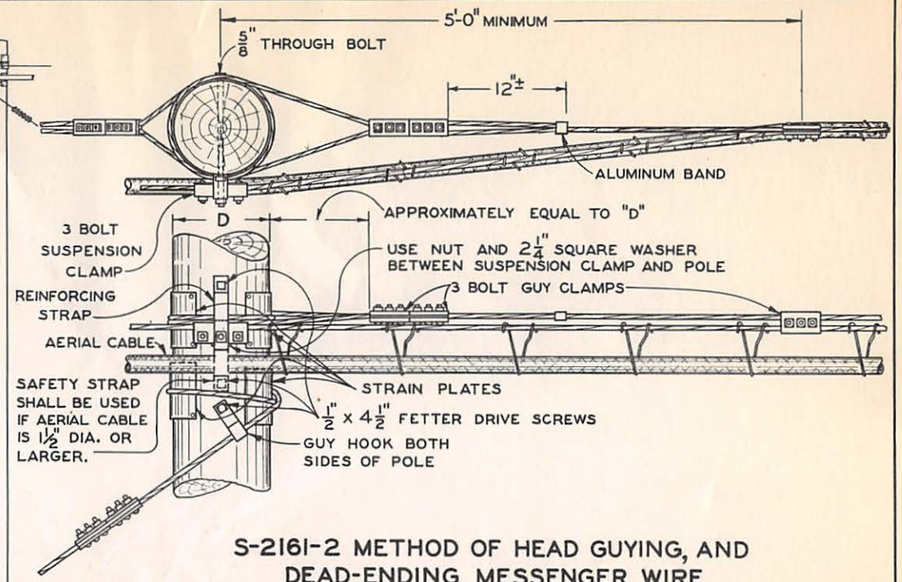
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: MAR. 15, 1937
CHIEF ENGINEER



OVERHEAD CABLE CROSSING
NO SCALE



S-2161-1 APPLICATION OF CONDUIT


5'-0" MINIMUM
⅝" THROUGH BOLT
12"±
ALUMINUM BAND
D
APPROXIMATELY EQUAL TO "D"
3 BOLT SUSPENSION CLAMP
USE NUT AND 2¼" SQUARE WASHER BETWEEN SUSPENSION CLAMP AND POLE
3 BOLT GUY CLAMPS
REINFORCING STRAP
AERIAL CABLE
SAFETY STRAP SHALL BE USED IF AERIAL CABLE IS 1½" DIA. OR LARGER.
STRAIN PLATES
½" X 4½" FETTER DRIVE SCREWS
GUY HOOK BOTH SIDES OF POLE

S-2161-2 METHOD OF HEAD GUYING, AND DEAD-ENDING MESSENGER WIRE

SCALE IN INCHES
0 12 24

APPROVED FOR USE
THE CHESAPEAKE AND OHIO RAILWAY COMPANY VICE PRESIDENT AND GENERAL MANAGER
ERIE RAILROAD COMPANY VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY EXECUTIVE VICE PRESIDENT
PERE MARQUETTE RAILWAY COMPANY VICE PRESIDENT
C.H.W. C.H.W. C.D.M. A.J.P.

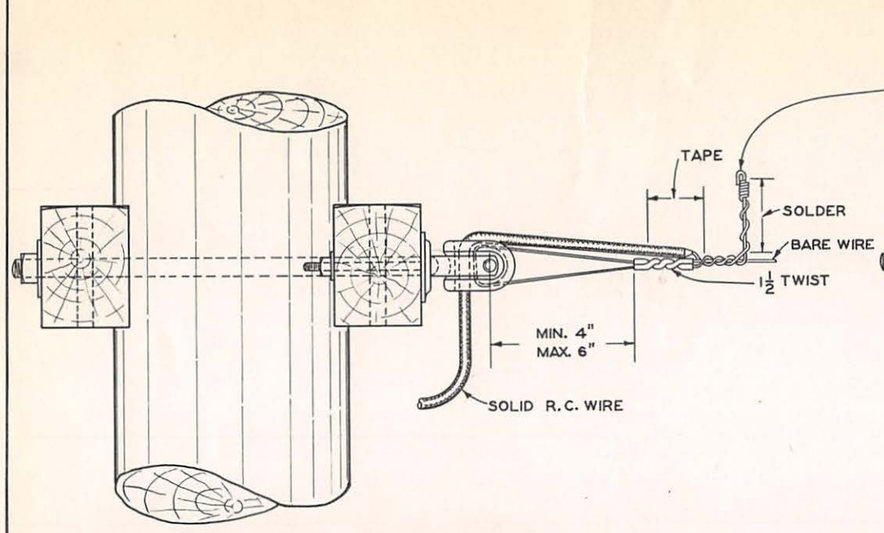
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

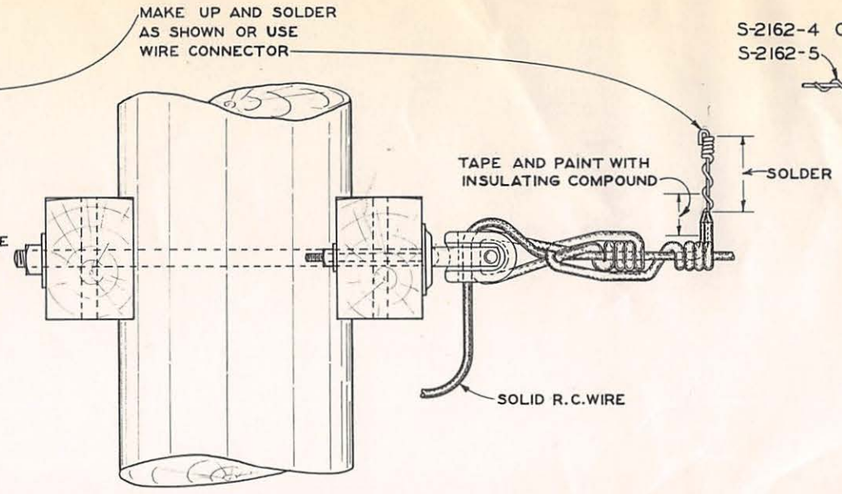
OVERHEAD CABLE CROSSING PROTECTION

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: CHIEF ENGINEER MAR. 15, 1937

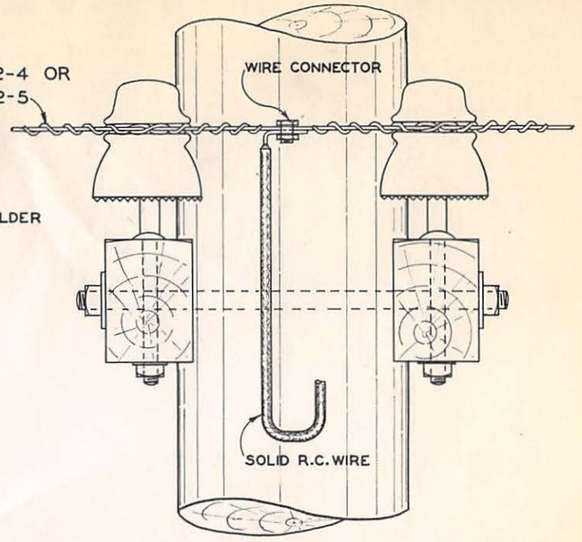
S-2161



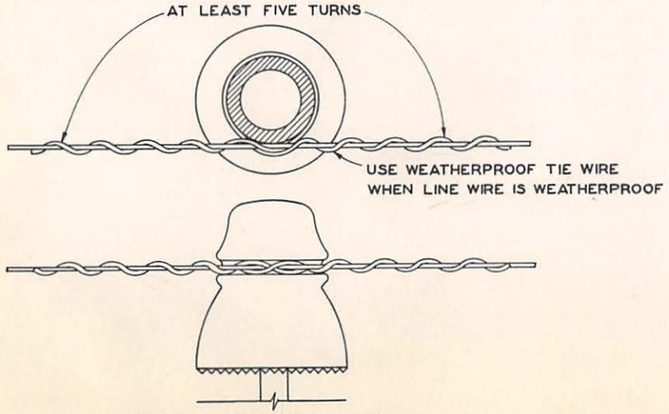
S-2162-1 DEAD ENDING BARE LINE WIRE



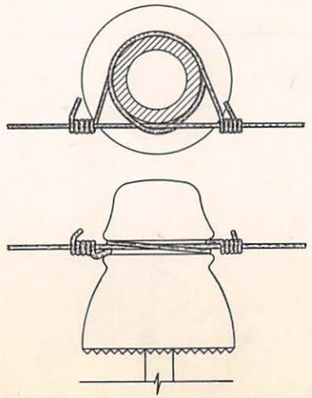
S-2162-2 DEAD ENDING WEATHERPROOF LINE WIRE



S-2162-3 TAPPING LINE WIRE



S-2162-4 TIE WIRE DETAIL
FOR BARE OR WEATHERPROOF WIRE



S-2162-5 TIE WIRE DETAIL
OPTIONAL FOR WEATHERPROOF WIRE

NOTE
FOR INFORMATION CONCERNING DEAD ENDING SIGNAL POWER WIRES SEE STANDARD DRAWING S-2160 SHEET 1, STANDARD LAYOUT FOR TRANSFORMER CONNECTIONS ON 440 VOLT SIGNAL POWER LINE.

NO SCALE

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
EXECUTIVE VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

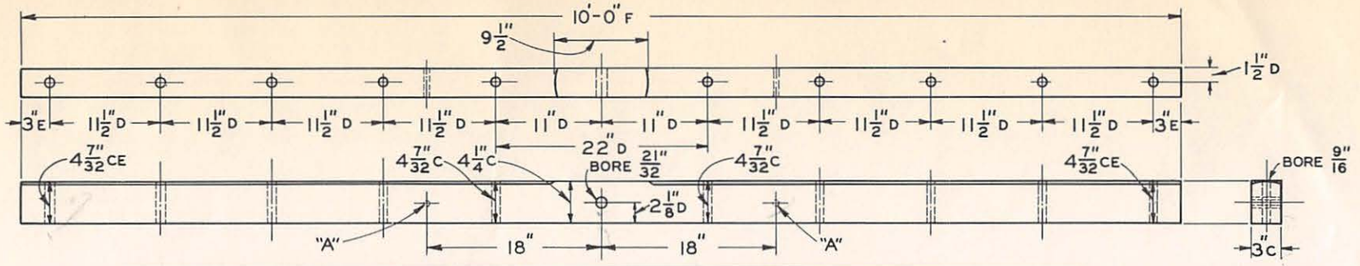
C.H.W. C.H.W. C.D.M. A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

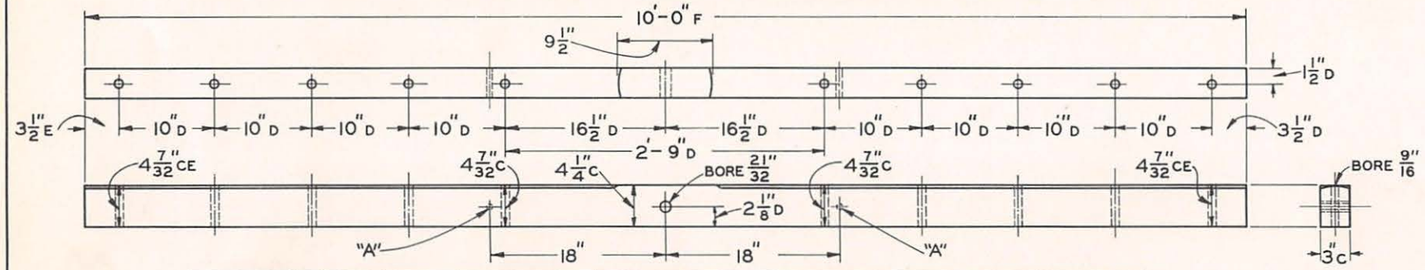
STANDARD METHOD OF DEAD ENDING AND TAPPING SIGNAL LINE WIRES

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: CHIEF ENGINEER MAR. 15, 1937

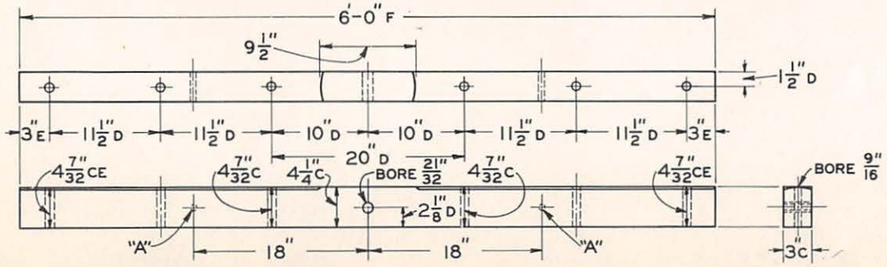
S-2162



DOUGLAS FIR	UNTREATED SOUTHERN PINE	TREATED SOUTHERN PINE	DESCRIPTION
S-2165-1	S-2165-3	S-2165-5	TEN PIN CROSSARM WITH HOLES "A" BORED 13/32"
S-2165-2	S-2165-4	S-2165-6	TEN PIN CROSSARM WITHOUT HOLES "A"



DOUGLAS FIR	UNTREATED SOUTHERN PINE	TREATED SOUTHERN PINE	DESCRIPTION
S-2165-7	S-2165-9	S-2165-11	TEN PIN CROSSARM WITH HOLES "A" BORED 13/32"
S-2165-8	S-2165-10	S-2165-12	TEN PIN CROSSARM WITHOUT HOLES "A"



DOUGLAS FIR	UNTREATED SOUTHERN PINE	TREATED SOUTHERN PINE	DESCRIPTION
S-2165-13	S-2165-15	S-2165-17	SIX PIN CROSSARM WITH HOLES "A" BORED 13/32"
S-2165-14	S-2165-16	S-2165-18	SIX PIN CROSSARM WITHOUT HOLES "A"

ALLOWABLE VARIATIONS

	OVER	UNDER
C	1/16"	1/16"
D	1/8"	1/8"
E	1/4"	1/4"
F	1/2"	1/2"
CE	1/16"	1/4"

NOTE

CROSSARMS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD MATERIAL SPECIFICATIONS J-58, SPECIFICATIONS AND INSTRUCTIONS FOR ORDERING AND INSPECTING LUMBER AND TIMBER FOR RAILWAY USES.

SCALE IN FEET
0 1 2

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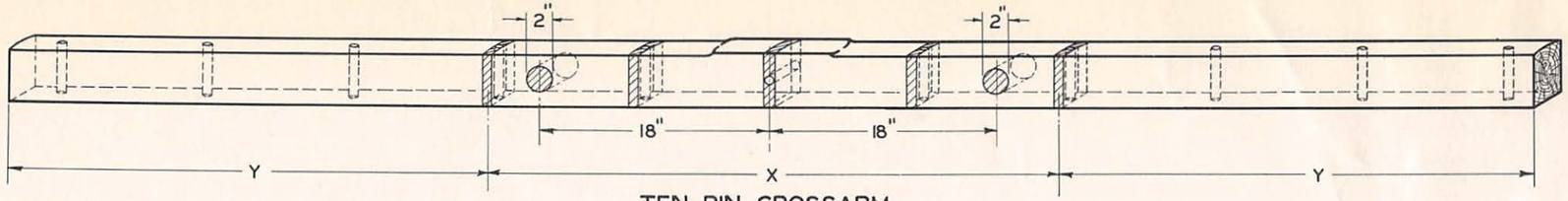
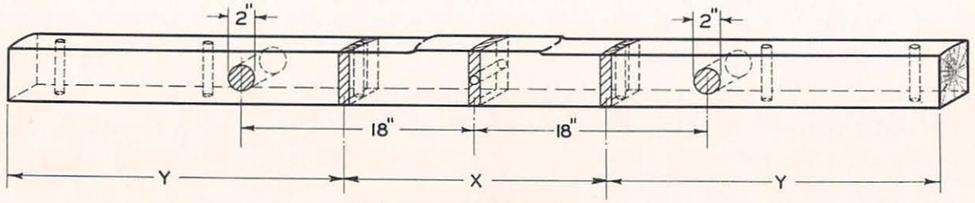
STANDARD CROSSARMS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: MAR. 15, 1937
CHIEF ENGINEER



TEN PIN CROSSARM

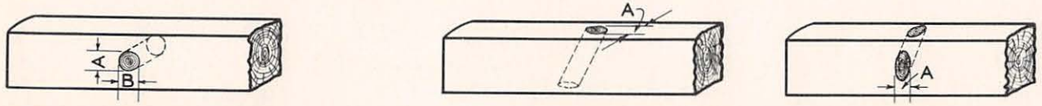


SIX PIN CROSSARM

TABLE A		
KINDS OF KNOTS		
SOUND AND BLACK	ENCASED, PARTIALLY ENCASED, AND LOOSE	ROTTEN
PERMITTED	PERMITTED PROVIDED THEY DRAIN WATER. LOOSE AND ENCASED KNOTS ARE NOT PERMITTED ON TOP SURFACE OF CROSSARM.	NOT PERMITTED

NOTES

1. SHADED PORTIONS OF THE CROSSARMS SHALL BE FREE FROM KNOTS.
2. SECTION X–IN THIS SECTION OF THE CROSSARM, EXCEPT IN SHADED PORTIONS, KNOTS AS NOTED IN TABLE "A" ARE PERMITTED PROVIDED THEY ARE NOT LARGER THAN $\frac{3}{4}$" AVERAGE DIAMETER.
3. SECTION Y–IN THIS SECTION OF THE CROSSARM, EXCEPT IN SHADED PORTIONS, KNOTS AS NOTED IN TABLE "A" VARYING IN SIZE FROM NOT LARGER THAN $\frac{3}{4}$" AVERAGE DIAMETER NEAR THE INNER END OF THE SECTION TO NOT MORE THAN $\frac{1}{2}$ THE CROSS SECTION AT THE END OF THE CROSSARM ARE PERMITTED.



AXIS AT RIGHT ANGLES TO FACE
AVERAGE DIAMETER= $\frac{A+B}{2}$

AXIS NOT AT RIGHT ANGLES TO FACE
DIAMETER=A

DETERMINATION OF DIAMETER OF KNOTS

NO SCALE

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STANDARD CROSSARMS

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APPROVED: MAR. 15, 1937
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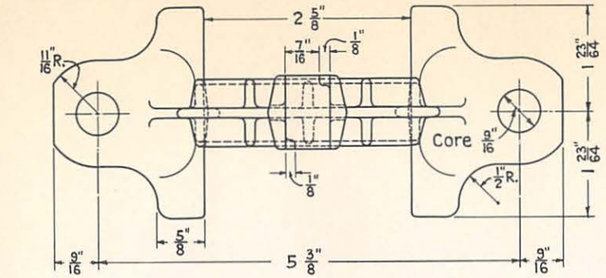
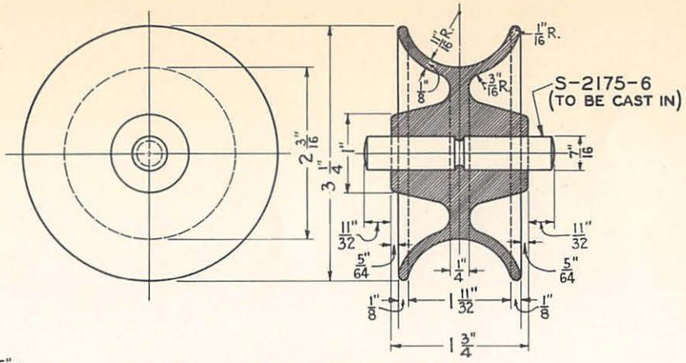
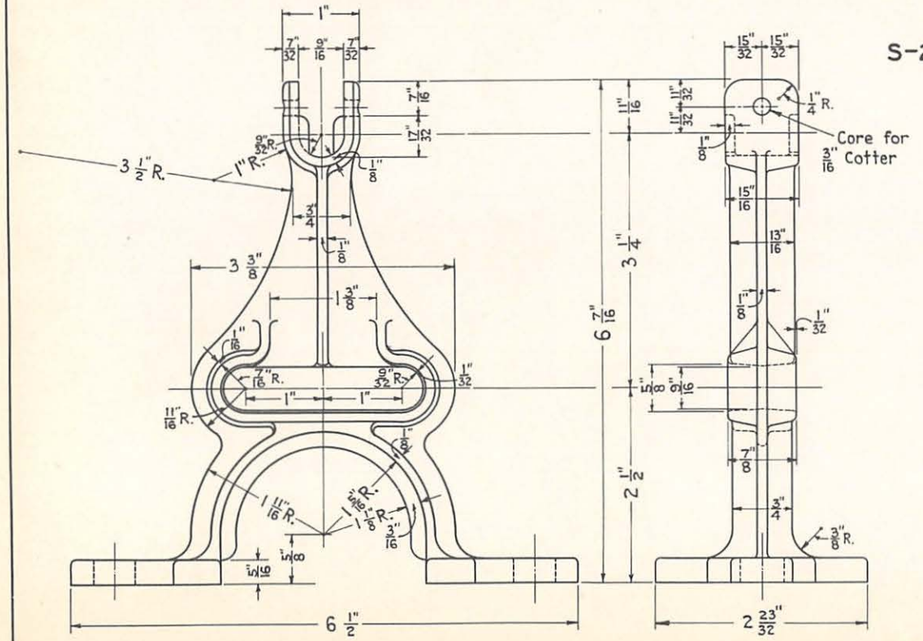
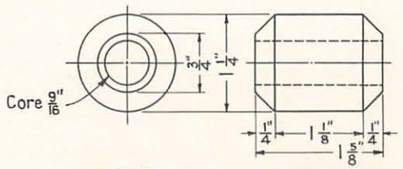




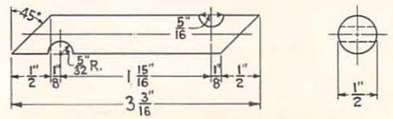
S-2175-3 BOTTOM ROLLER
CAST IRON
SCALE ②



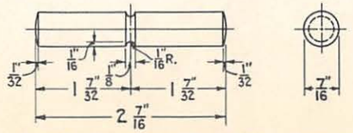
S-2175-2 PIPE CARRIER SIDE
MALL. IRON
SCALE ②



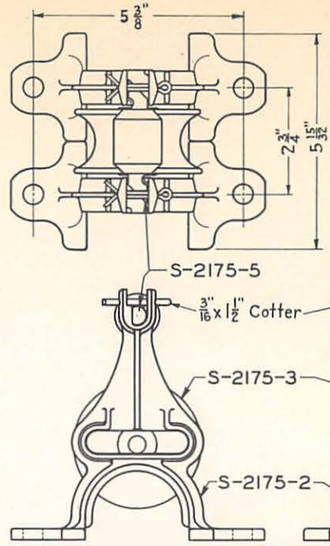
S-2175-4 TOP ROLLER
CAST IRON
SCALE ②



S-2175-5 TOP ROLLER PIN
O:H. STEEL
SCALE ②



S-2175-6 BOTTOM ROLLER PIN
O:H. STEEL
SCALE ②



S-2175-1 ONE WAY UNIVERSAL
PIPE CARRIER COMPLETE
SCALE ①

NOTE
PIPE CARRIER SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES.
① 0 1 2 3 4 5 6
② 0 1 2 3

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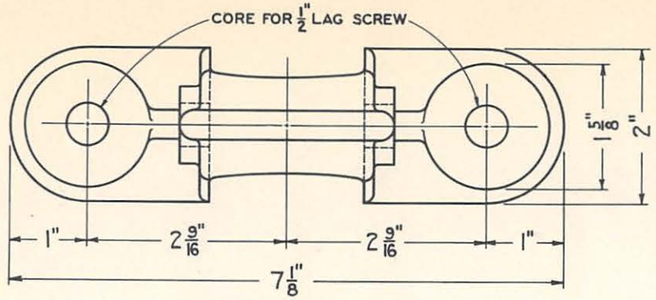
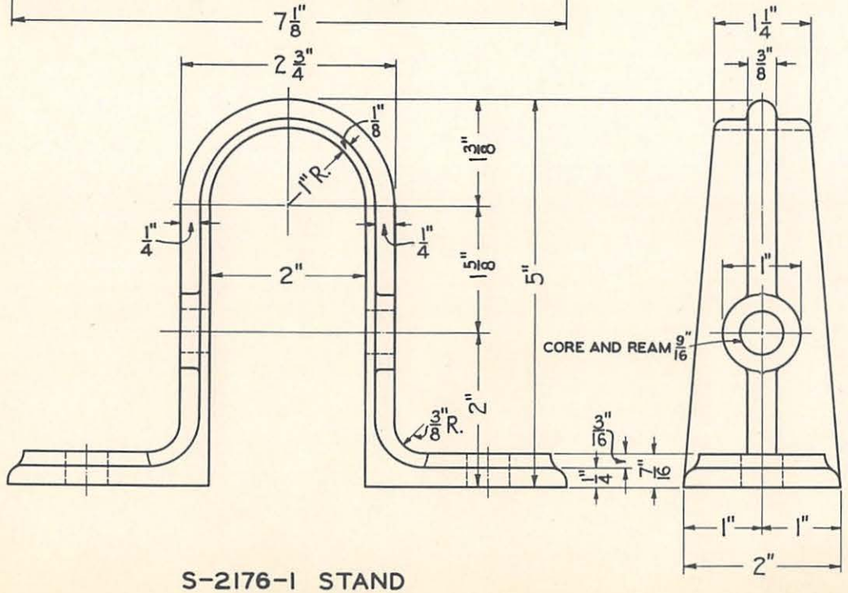
STANDARD UNIVERSAL PIPE CARRIER.

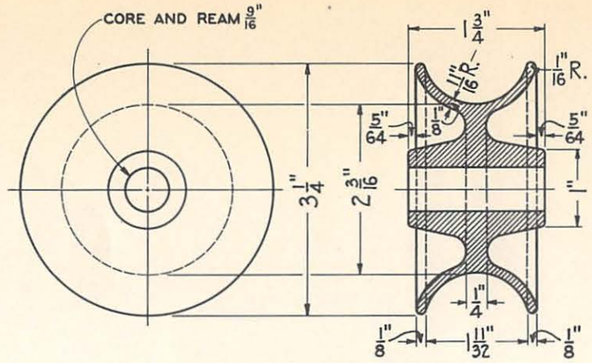
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 17. 1931.
CHIEF ENGINEER

S-2175

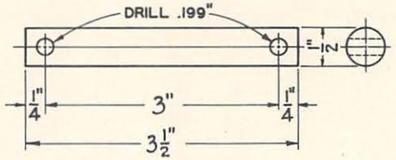




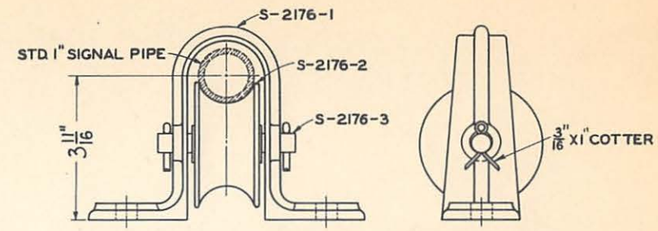
S-2176-1 STAND
MALLEABLE IRON
SCALE ②



S-2176-2 SHEAVE
CAST IRON
SCALE ②



S-2176-3 PIN
COLD ROLLED STEEL
SCALE ②



S-2176-4 STRAP PIPE CARRIER COMPLETE
SCALE ①

NOTE
PIPE CARRIER SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
① 0 1 2 3 4 5 6
② 0 1 2 3

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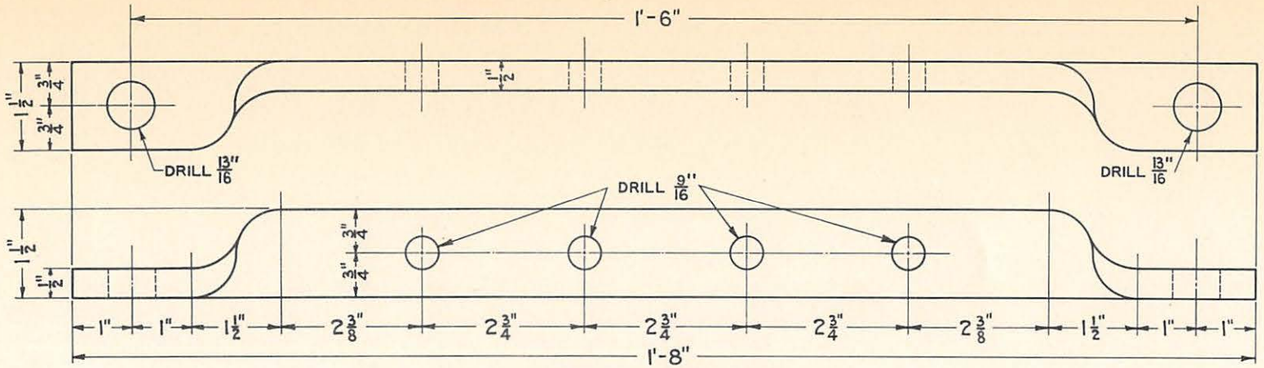
STANDARD
STRAP PIPE CARRIER

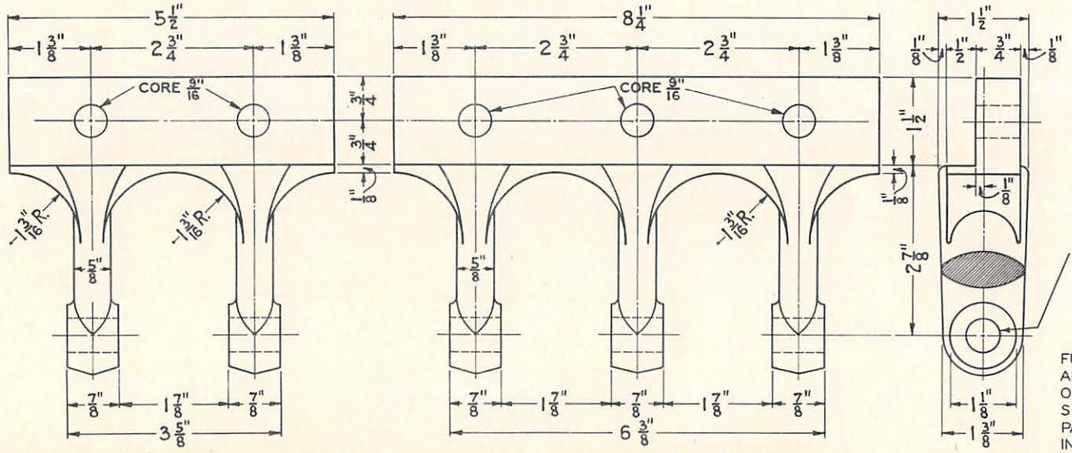
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: OCTOBER 20, 1931
CHIEF ENGINEER

S-2176



S-2177-1 SUPPORT

OPEN-HEARTH STEEL
SCALE ②

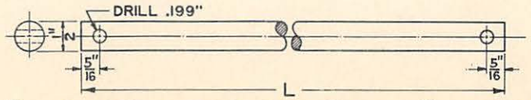


S-2177-2 ONE-WAY HANGER

CAST IRON
SCALE ②

S-2177-3 TWO-WAY HANGER

CAST IRON
SCALE ②

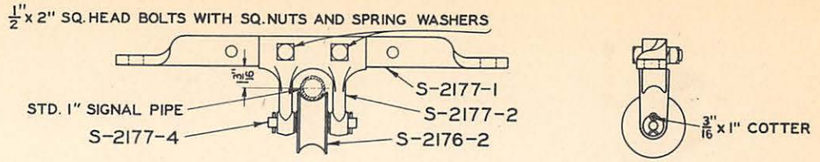


S-2177-4 ONE-WAY PIN, L=4 1/2"

S-2177-5 TWO-WAY PIN, L=7 1/4"

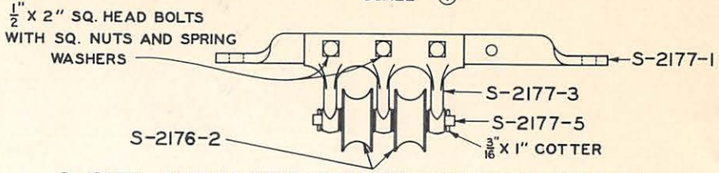
S-2177-6 THREE-WAY PIN, L=10"

ALL PINS COLD ROLLED STEEL
SCALE ②



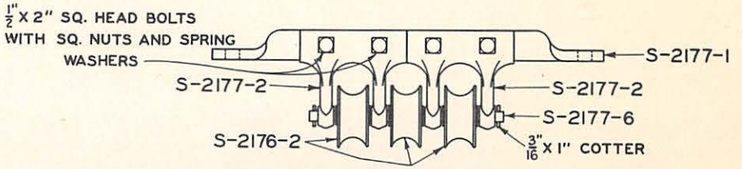
S-2177-7 ONE-WAY TRANSVERSE PIPE CARRIER COMPLETE

SCALE ①



S-2177-8 TWO-WAY TRANSVERSE PIPE CARRIER COMPLETE

SCALE ①



S-2177-9 THREE-WAY TRANSVERSE PIPE CARRIER COMPLETE

SCALE ①

SCALE IN INCHES

① 0 1 3 6 9 12

② 0 1 2 3 4

NOTE

PIPE CARRIER SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

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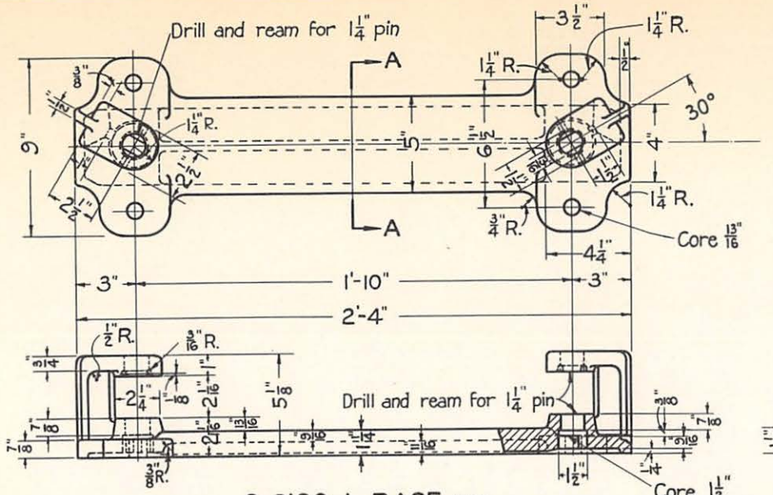
STANDARD TRANSVERSE PIPE CARRIER

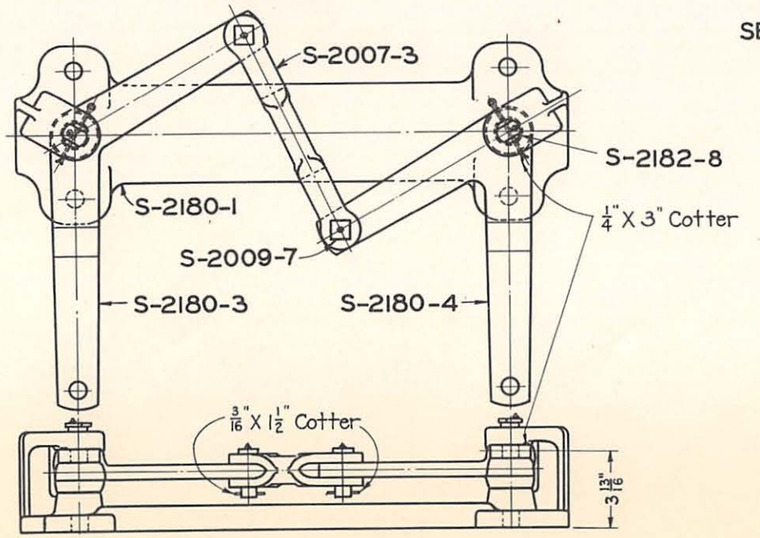
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JULY 22, 1931
CHIEF ENGINEER

S-2177

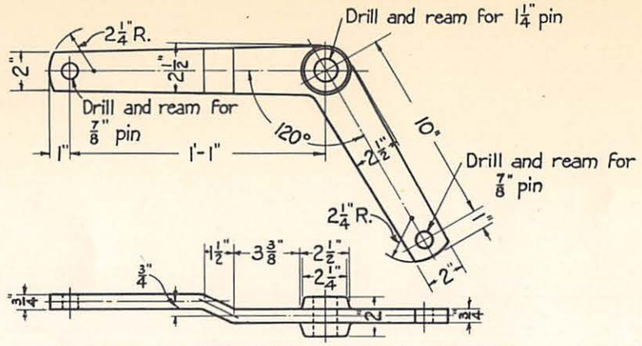


S-2180-1 BASE ONLY

CAST IRON

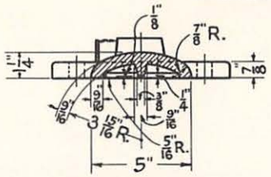


S-2180-2 PIPE COMPENSATOR COMPLETE.

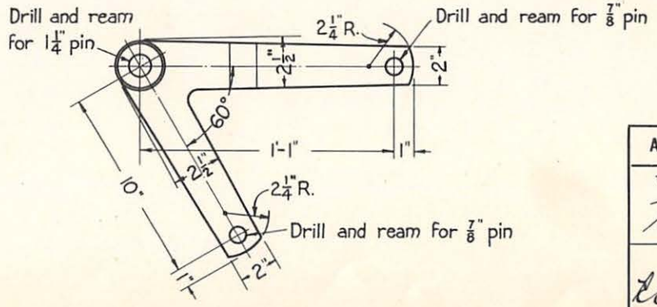


S-2180-3 OBTUSE ANGLE CRANK

FORGED STEEL



SECTION A-A



S-2180-4 ACUTE ANGLE CRANK

FORGED STEEL

NOTE

COMPENSATOR SHALL BE FURNISHED WITH ALL ITS SURFACES EXCEPT HOLES, PINS, AND BEARING SURFACES, PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES

0 1 2 3 4 5 6 7 8 9 10 11 12

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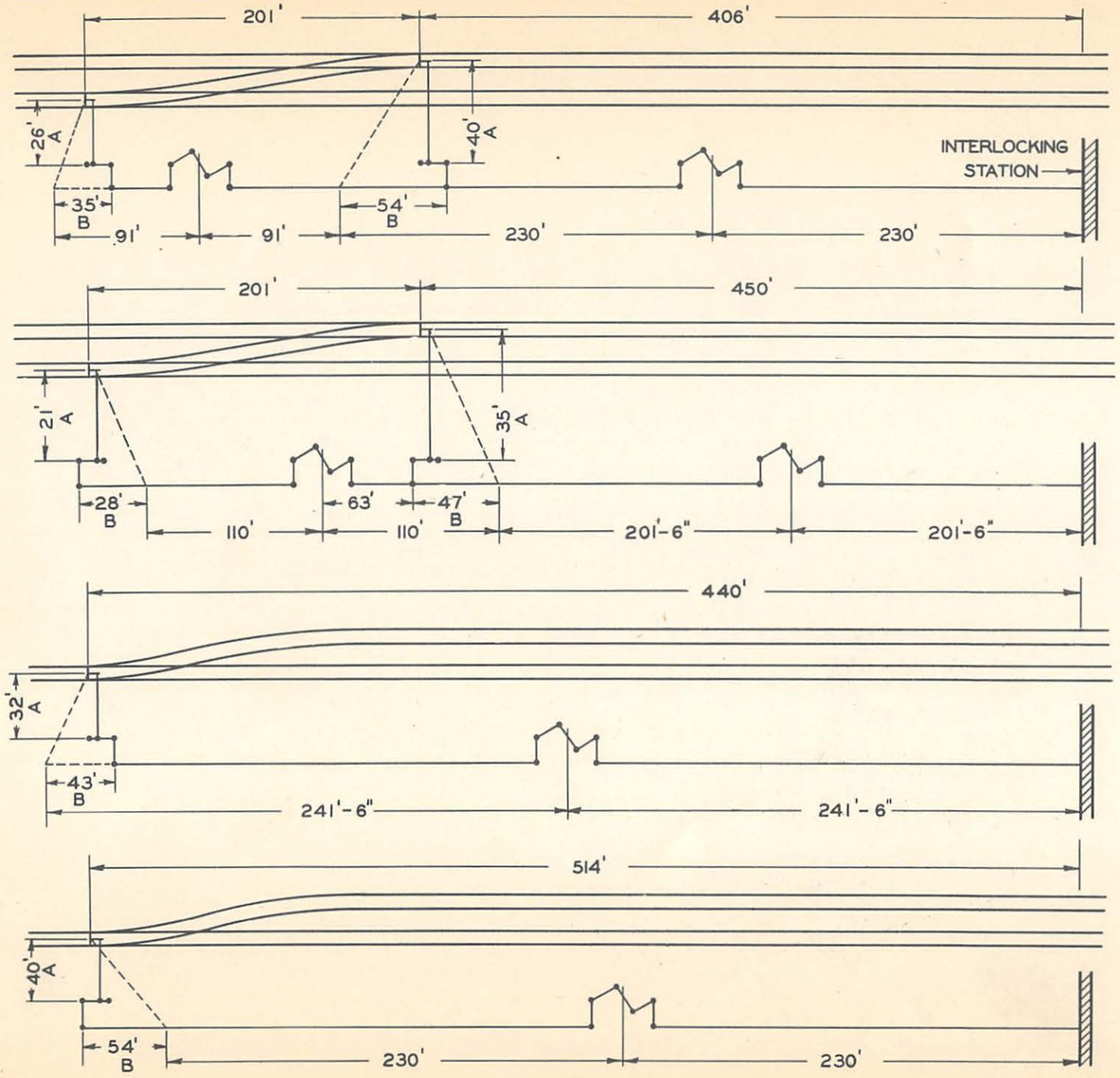
STANDARD PIPE COMPENSATOR

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: CHIEF ENGINEER MAY 19, 1931

S-2180



NOTES

DRILLING OF CRANK ARMS FOR SWITCH

To find drilling for length of crank arm on switch side which will give the required stroke: multiply the required stroke at switch by length of crank arm on lever side and divide by the stroke of the lever.

EXAMPLE:

Throw of Switch Points	5.0"
Lost Motion in Switch Adjustment	1.5"
Required stroke at Switch	6.5"
Length of Crank Arm on Lever Side	11.75"
Stroke of Lever	8.75"

$\frac{6.5" \times 11.75"}{8.75"} = 8.75"$ Approx.

DRILLING OF CRANKS
Lever Side 11.75"
Switch Side 8.75"

SETTING OF COMPENSATORS

When drilling of crank arms at switch are of unequal lengths, the length of pipe "B" to be compensated will not be equal to length of pipe "A". To find length "B" use the following formula:

$$\frac{\text{Length "A" x Length of Crank Arm on Lever side}}{\text{Length of Crank on Switch side}} = \text{Length "B"}$$

or

Given:

Length "A"	32'
Crank on Lever Side	11.75"
Crank on Switch Side	8.75"

Then:

$\frac{32' \times 11.75"}{8.75"} = 43$ Ft. Approx.

With normal crank, length "B" must be added to length of pipe line; with reversed crank it must be subtracted.

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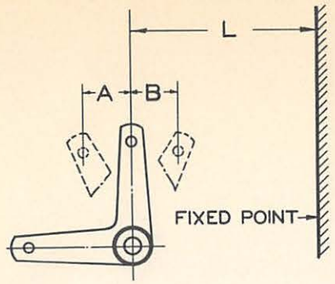
STANDARD PIPE COMPENSATION

APPROVED BY -
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: OCTOBER 20, 1931
CHIEF ENGINEER

SHEET 1 OF 2

S-2181



DIRECTIONS FOR USING CRANK CHART

Write the mean temperature in degrees F. for locality in which the chart is to be used in degree column opposite "mean temperature," graduating 10° for each space, increasing upward and decreasing downward.

The figure in square opposite temperature at time of installation and under the number of feet "L" between crank and fixed point, is the distance "B" or "A" in inches, the crank should be set towards or away from the fixed point.

F°	20'	40'	60'	80'	100'	120'	140'	160'	180'	200'	220'	240'	260'	280'	300'	L
°	1/8	5/16	1/2	5/8	13/16	15/16	1 1/8	1 1/4	1 7/16	1 5/8	1 3/4	1 15/16	2 1/16	2 1/4	2 3/8	A- AWAY FROM FIXED POINT
°	1/8	1/4	7/16	9/16	3/4	7/8	1	1 1/8	1 1/4	1 7/16	1 9/16	1 3/4	1 7/8	2	2 3/16	
°	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 7/16	1 9/16	1 11/16	1 13/16	1 15/16	
°	1/8	1/4	5/16	7/16	9/16	11/16	13/16	7/8	1	1 1/8	1 1/4	1 3/8	1 7/16	1 9/16	1 11/16	
°	1/8	3/16	5/16	3/8	1/2	9/16	11/16	3/4	7/8	1 5/16	1 1/16	1 1/8	1 1/4	1 3/8	1 7/16	
°	1/16	3/16	1/4	5/16	3/8	1/2	9/16	5/8	3/4	1 3/16	7/8	1 5/16	1 1/16	1 1/8	1 3/16	
°	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	1 3/16	7/8	1 15/16	
°	1/16	1/8	1/8	3/16	1/4	5/16	5/16	3/8	7/16	1/2	1/2	9/16	5/8	11/16	3/4	
°	1/16	1/16	1/8	1/8	3/16	3/16	1/4	1/4	5/16	5/16	3/8	3/8	7/16	7/16	1/2	
°	1/16	1/16	1/16	1/16	1/16	1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16	1/4	1/4	
°	← MEAN TEMPERATURE →															
°	1/16	1/16	1/16	1/16	1/16	1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16	1/4	1/4	B- TOWARDS FIXED POINT
°	1/16	1/16	1/8	1/8	3/16	3/16	1/4	1/4	5/16	5/16	3/8	3/8	7/16	7/16	1/2	
°	1/16	1/8	1/8	3/16	1/4	5/16	5/16	3/8	7/16	1/2	1/2	9/16	5/8	11/16	3/4	
°	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	1 15/16	
°	1/16	3/16	1/4	5/16	3/8	1/2	9/16	5/8	3/4	13/16	7/8	1 15/16	1 1/16	1 1/8	1 3/16	
°	1/8	3/16	5/16	3/8	1/2	9/16	11/16	3/4	7/8	1 15/16	1 1/16	1 1/8	1 1/4	1 3/8	1 7/16	
°	1/8	1/4	5/16	7/16	9/16	11/16	13/16	7/8	1	1 1/8	1 1/4	1 3/8	1 7/16	1 9/16	1 11/16	
°	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 7/16	1 9/16	1 11/16	1 13/16	1 15/16	
°	1/8	1/4	7/16	9/16	3/4	7/8	1	1 1/8	1 1/4	1 7/16	1 9/16	1 3/4	1 7/8	2	2 3/16	
°	1/8	5/16	1/2	5/8	13/16	15/16	1 1/8	1 1/4	1 7/16	1 5/8	1 3/4	1 15/16	2 1/16	2 1/4	2 3/8	

CRANK CHART

DIRECTIONS FOR USING COMPENSATION CHART

Ascertain the mean temperature in degrees F. of the locality in which the chart is to be used. Mark the vertical line at 22 with this number. Mark each oblique line to represent intervals of 10° by filling in the empty brackets - increasing to the left and decreasing to the right.

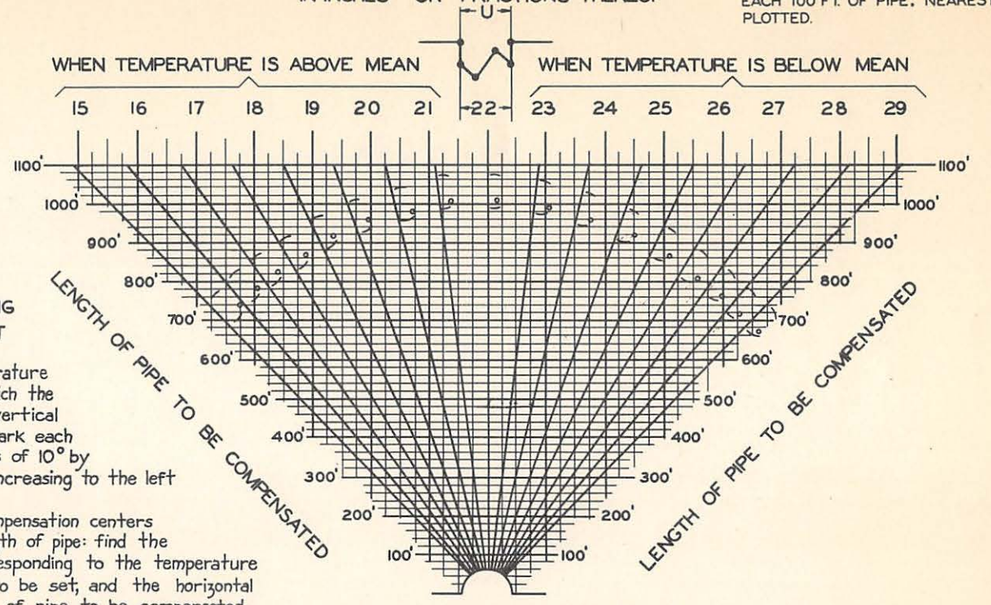
To determine the proper compensation centers for a given temperature and length of pipe: find the intersection of oblique line corresponding to the temperature at the time the compensator is to be set, and the horizontal line corresponding to the length of pipe to be compensated. Follow up the nearest vertical line and get reading on scale.

EXAMPLE

Find compensator centers for a pipe line 700 Ft. long, the temperature being 70° F.

Suppose the mean temperature at point of installation is found to be 50° F. In this case the 70° line will be the second to the left of the vertical. Find intersection of this line with horizontal line marked 700 Ft. Follow up the nearest vertical line getting a reading of 20⅞ inches for compensation centers.

COMPENSATION CENTERS "U" IN INCHES OR FRACTIONS THEREOF



COMPENSATION CHART

NOTE

VALUES OF "U" ARE BASED ON .08 INCH AS A COEFFICIENT OF EXPANSION FOR AN INCREASE OF 10°F. FOR EACH 100 FT. OF PIPE. NEAREST 1/16 IN. HAS BEEN PLOTTED.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

C.H.W.	C.D.M.	A.J.P.
C.H.W.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

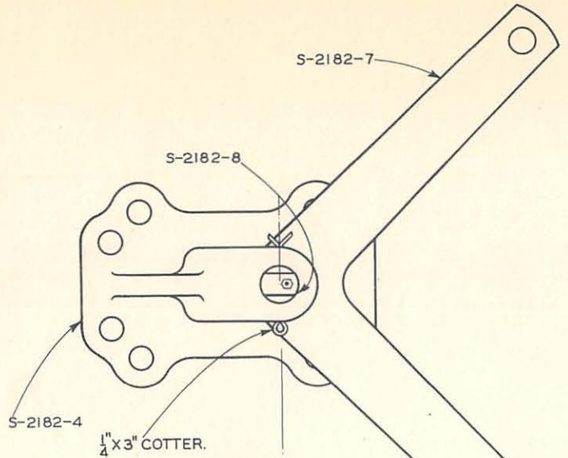
STANDARD PIPE COMPENSATION

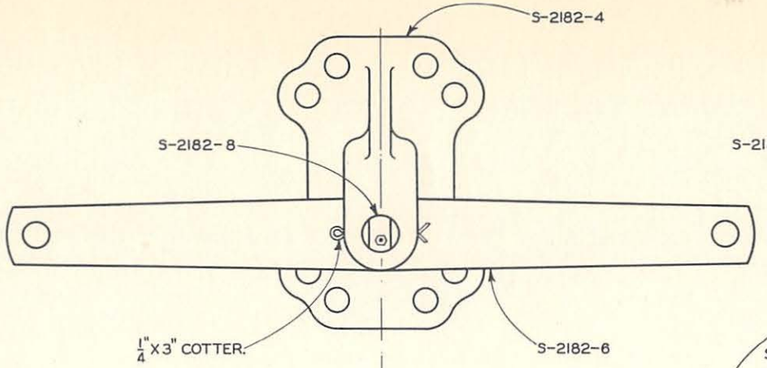
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: OCTOBER 20, 1931
CHIEF ENGINEER

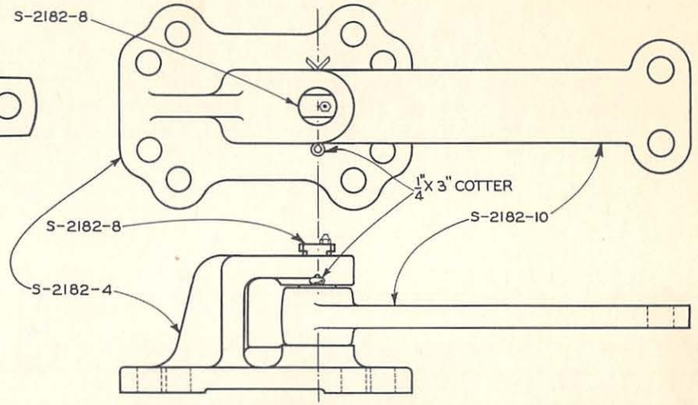
SHEET 2 OF 2
S-2181

NOTE

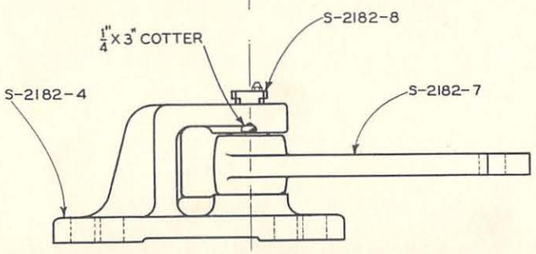
CRANKS AND STAND SHALL BE FURNISHED WITH ALL SURFACES EXCEPT PIN HOLES, PINS, AND BEARING SURFACES, PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



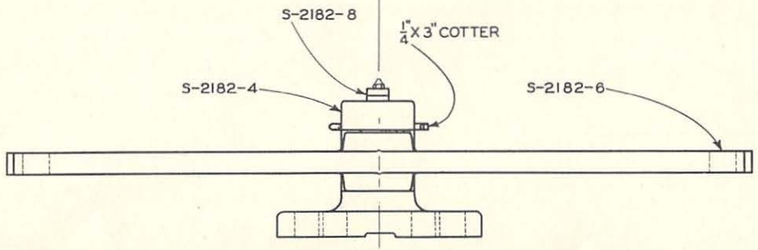




S-2182-3 RADIAL ARM AND STAND COMPLETE



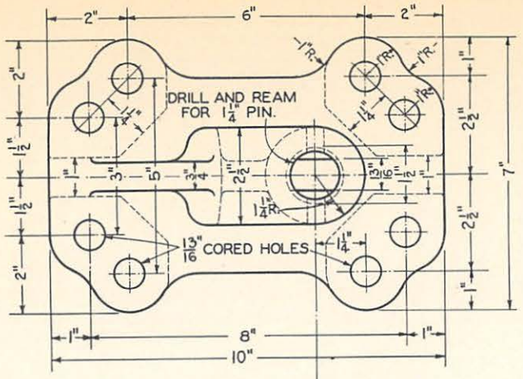
S-2182-1 RIGHT ANGLE CRANK AND STAND COMPLETE

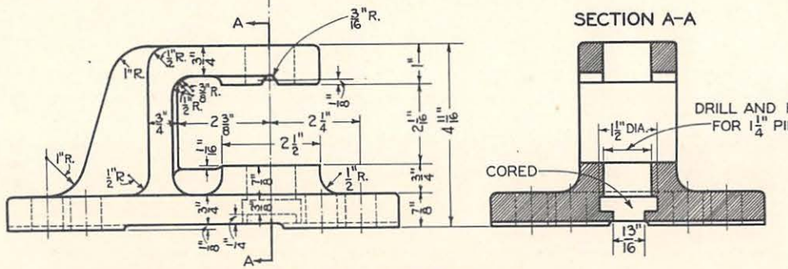


S-2182-2 STRAIGHT ARM CRANK AND STAND COMPLETE

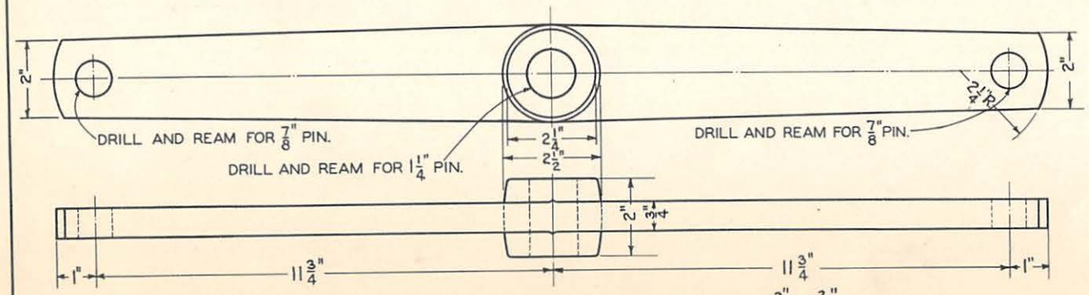
SCALE IN INCHES
0 1 2 3 4 5 6 7 8

APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY VICE PRESIDENT AND GENERAL MANAGER	THE CHESAPEAKE AND OHIO RAILWAY COMPANY ERIE RAILROAD COMPANY THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY PERE MARQUETTE RAILWAY COMPANY
ERIE RAILROAD COMPANY VICE PRESIDENT	STANDARD CRANKS AND STAND ONE-WAY HORIZONTAL
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY VICE PRESIDENT	APPROVED BY ADVISORY COMMITTEE ON WAY AND STRUCTURES
PERE MARQUETTE RAILWAY COMPANY VICE PRESIDENT	APPROVED: OCTOBER 20, 1931 CHIEF ENGINEER
C. S. L. / C. S. L. C. D. M. A. J. P.	SHEET 1 OF 2 S-2182

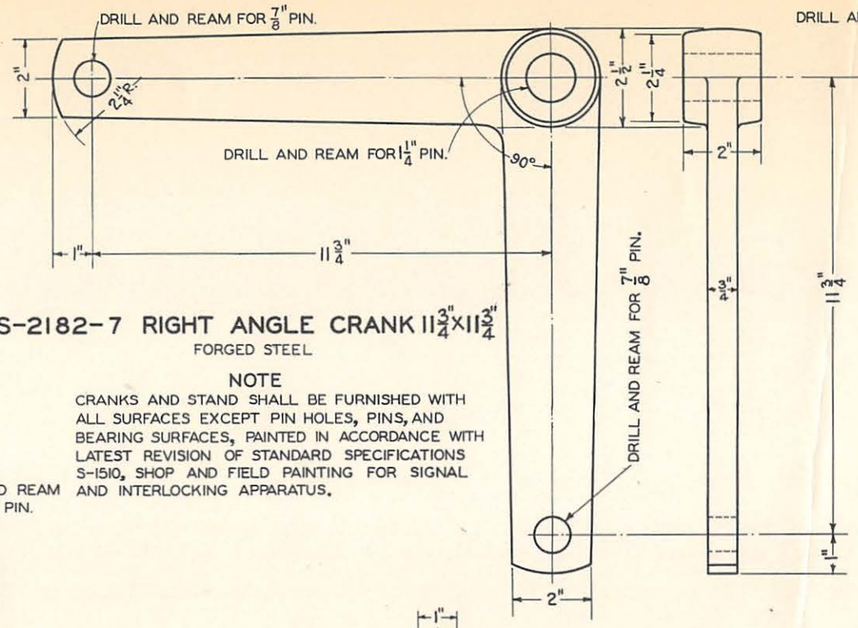




S-2182-4 ONE WAY CRANK STAND ONLY
S-2182-5 ONE WAY CRANK STAND WITH PIN S-2182-8
CAST IRON

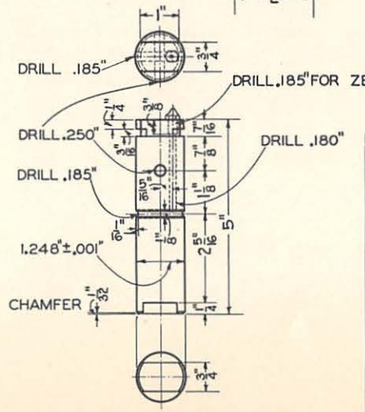


S-2182-6 STRAIGHT ARM CRANK 11¾"×11¾"
FORGED STEEL

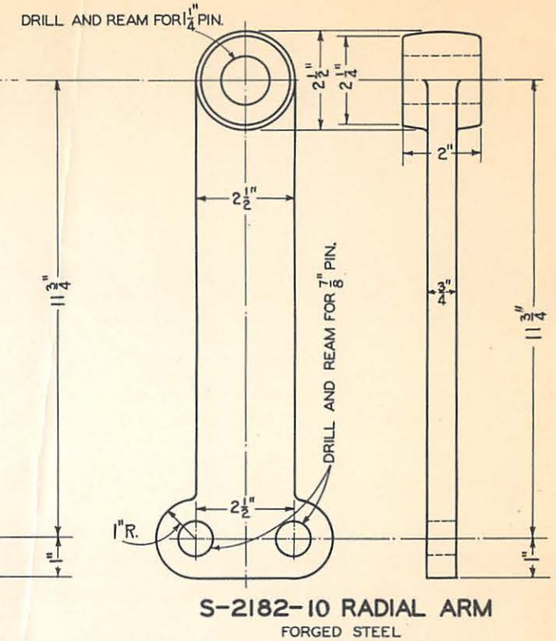


S-2182-7 RIGHT ANGLE CRANK 11¾"×11¾"
FORGED STEEL

NOTE
CRANKS AND STAND SHALL BE FURNISHED WITH ALL SURFACES EXCEPT PIN HOLES, PINS, AND BEARING SURFACES, PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



S-2182-8 CRANK PIN
WITH ZERK FITTING
S-2182-9 CRANK PIN ONLY
COLD ROLLED STEEL



S-2182-10 RADIAL ARM
FORGED STEEL

SCALE IN INCHES
0 1 2 3 4 5 6

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

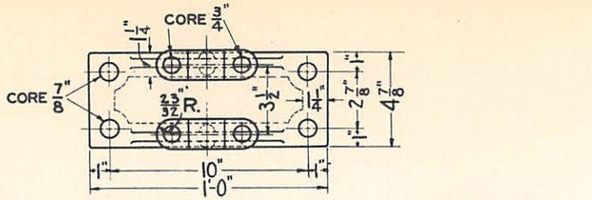
C.S.L.	C.D.M.	A.J.P.
C.S.L.		

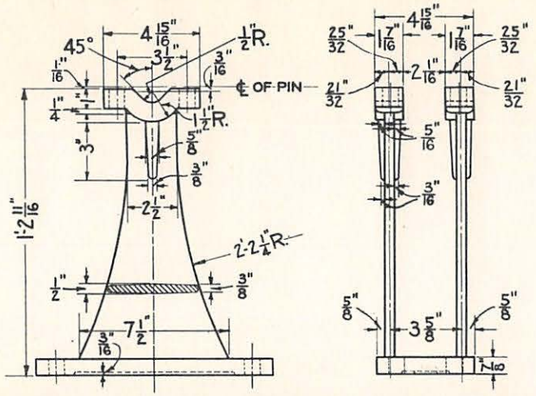
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD
CRANKS AND STAND ONE-WAY HORIZONTAL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: OCTOBER 20, 1931
CHIEF ENGINEER

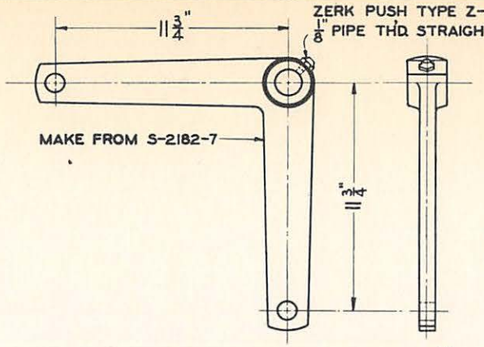
SHEET 2 OF 2
S-2182





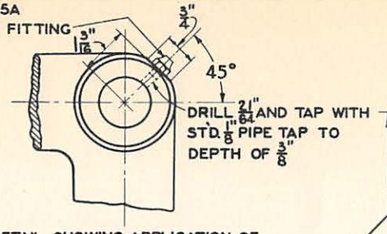
S-2184-1 ONE WAY VERTICAL CRANK STAND

CAST IRON
SCALE ①

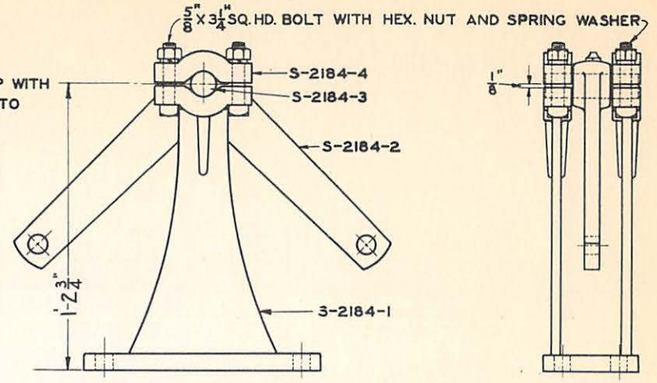


S-2184-2 RIGHT ANGLE CRANK 1 3/4" X 1 3/4"

FORGED STEEL
SCALE ①

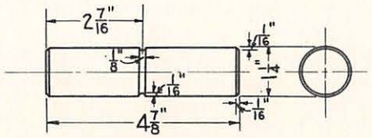


DETAIL SHOWING APPLICATION OF ZERK FITTING IN CRANK S-2184-2
SCALE ②



S-2184-6 ONE WAY VERTICAL STAND AND CRANK COMPLETE

SCALE ①



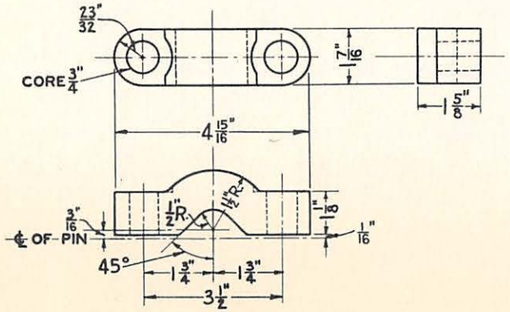
S-2184-3 PIN

COLD ROLLED STEEL
SCALE ②

NOTE

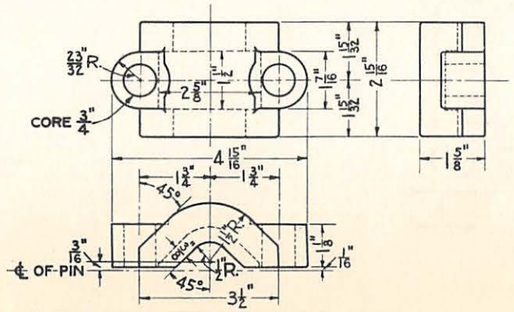
STANDS AND CRANKS SHALL BE FURNISHED WITH ALL SURFACES EXCEPT PINS, PIN HOLES, THREADS, AND BEARING SURFACES, PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
① 0 1 2 3 4 5 6 7 8 9 10 11 12
② 0 1 2 3 4 5 6



S-2184-4 END CAP

CAST IRON
SCALE ②



S-2184-5 INTERMEDIATE CAP

CAST IRON
SCALE ②

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D. Brooks
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
H. H. Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
J. H. Bowman
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
J. H. Bowman
VICE PRESIDENT

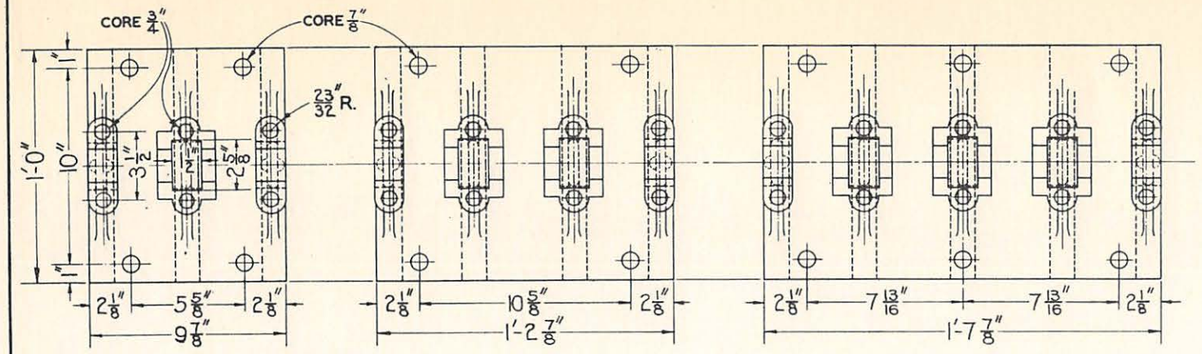
K.L.M.	C.D.M.	A.J.P.
K.L.M.		

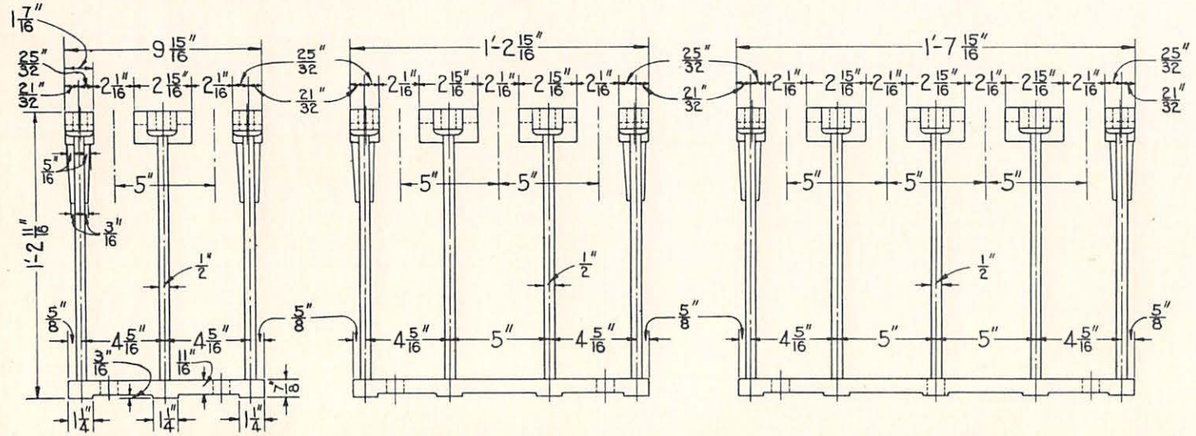
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD VERTICAL STANDS AND CRANK

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E. E. Winchel — CHIEF ENGINEER — NOV. 17, 1931.

SHEET 1 OF 2
S-2184

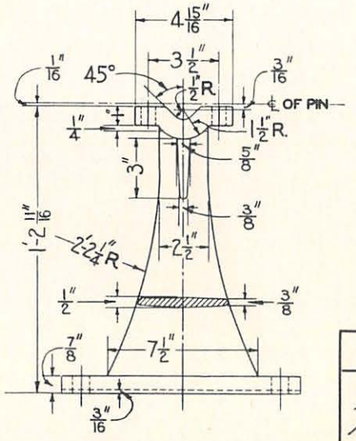




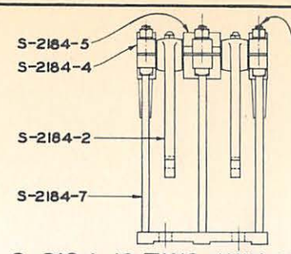
S-2184-7 TWO WAY VERTICAL STAND
CAST IRON
SCALE ②

S-2184-8 THREE WAY VERTICAL STAND
CAST IRON
SCALE ②

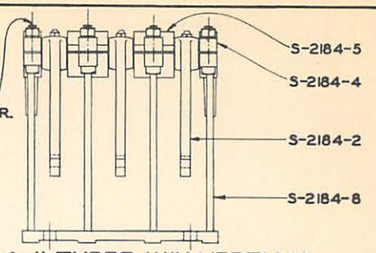
S-2184-9 FOUR WAY VERTICAL STAND
CAST IRON
SCALE ②



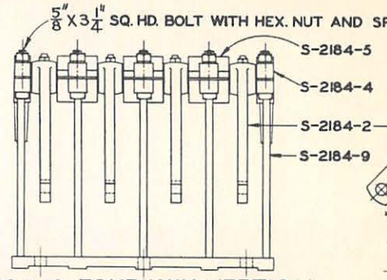
NOTE
STANDS AND CRANKS SHALL BE FURNISHED WITH ALL SURFACES EXCEPT HOLES, PINS, AND BEARING SURFACES, PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



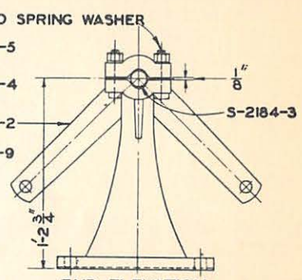
S-2184-10 TWO WAY VERTICAL STAND AND CRANKS COMPLETE
SCALE ①



S-2184-11 THREE WAY VERTICAL STAND AND CRANKS COMPLETE
SCALE ①



S-2184-12 FOUR WAY VERTICAL STAND AND CRANKS COMPLETE
SCALE ①



END ELEVATION OF ASSEMBLIES

SCALE IN INCHES
① 0 1 2 3 6 9 12 18
② 0 1 2 3 6 9 12

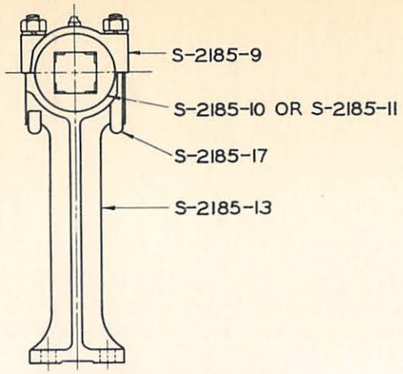
APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT AND GENERAL MANAGER	
ERIE RAILROAD COMPANY — VICE PRESIDENT	
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT	
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT	
K.L.M.	C.D.M. A.J.P.
K.L.M.	

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD VERTICAL STANDS AND CRANK

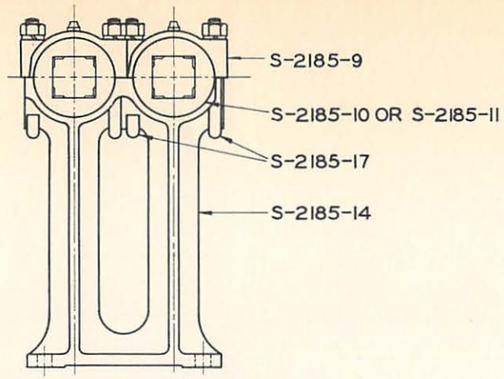
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: NOV. 17, 1931.
CHIEF ENGINEER

SHEET 2 OF 2
S-2184



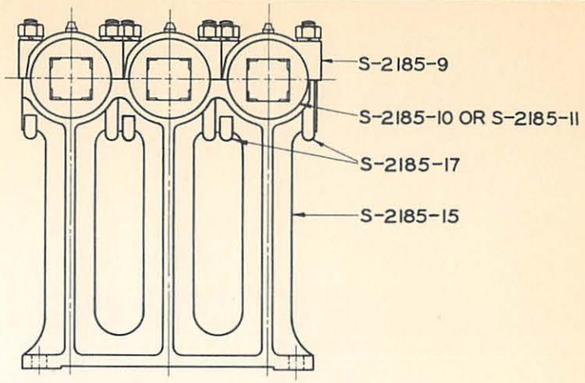
S-2185-1 ONE WAY BEARING
COMPLETE WITH 1 S-2185-10 PLAIN JOURNAL

S-2185-2 ONE WAY BEARING
COMPLETE WITH 1 S-2185-11 THRUST JOURNAL



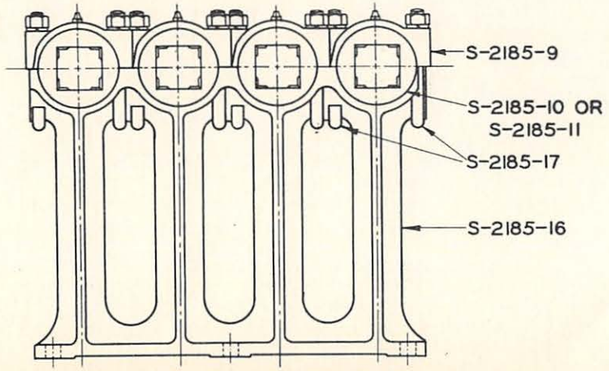
S-2185-3 TWO WAY BEARING
COMPLETE WITH 2 S-2185-10 PLAIN JOURNALS

S-2185-4 TWO WAY BEARING
COMPLETE WITH 2 S-2185-11 THRUST JOURNALS



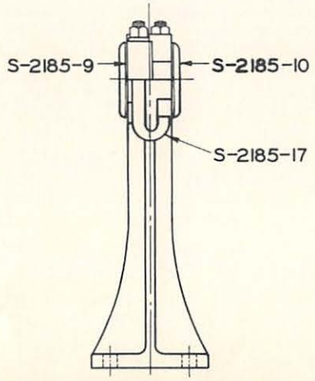
S-2185-5 THREE WAY BEARING
COMPLETE WITH 3 S-2185-10 PLAIN JOURNALS

S-2185-6 THREE WAY BEARING
COMPLETE WITH 3 S-2185-11 THRUST JOURNALS



S-2185-7 FOUR WAY BEARING
COMPLETE WITH 4 S-2185-10 PLAIN JOURNALS

S-2185-8 FOUR WAY BEARING
COMPLETE WITH 4 S-2185-11 THRUST JOURNALS



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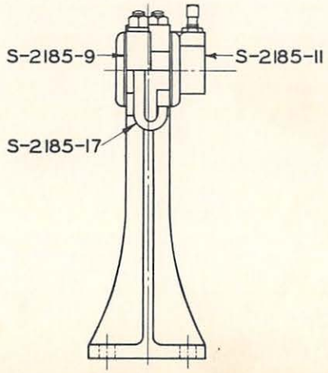
FITTED WITH S-2185-10
PLAIN JOURNAL



END ELEVATION OF BEARING
FITTED WITH S-2185-11
THRUST JOURNAL

NOTE
ALL PARTS EXCEPT THREADS AND BEARING SURFACES SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
0 1 2 3 6 9 12

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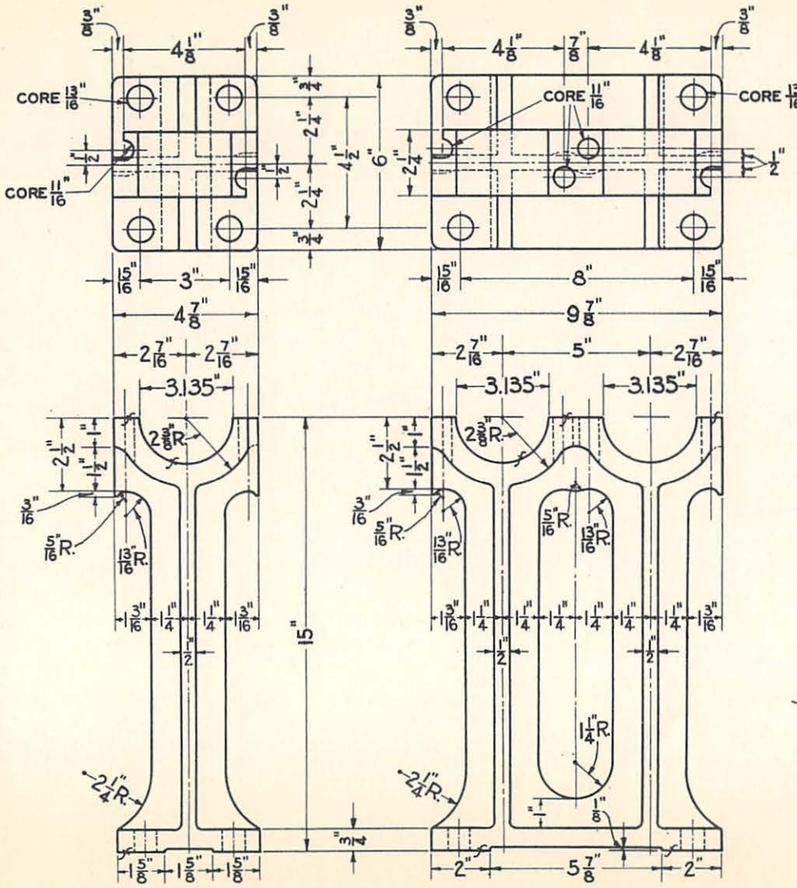
STANDARD ROCKING SHAFT BEARINGS

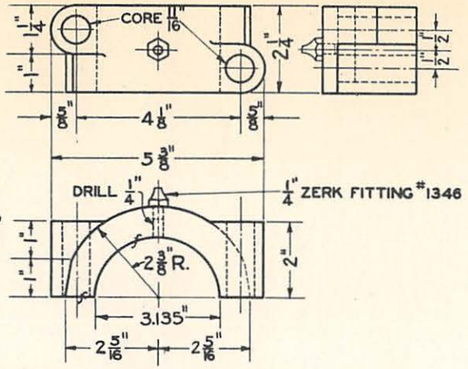
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: NOV. 17, 1931.
CHIEF ENGINEER

SHEET 1 OF 3
S-2185

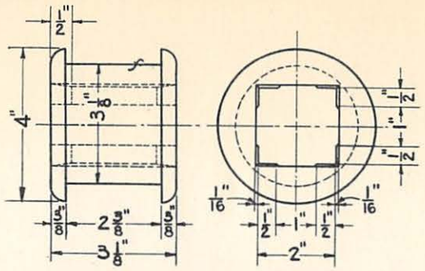


S-2185-13 ONE WAY STAND
CAST IRON
SCALE ①

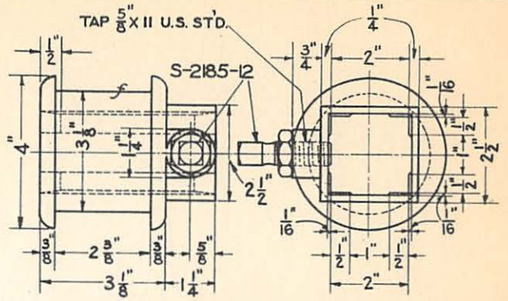
S-2185-14 TWO WAY STAND
CAST IRON
SCALE ①



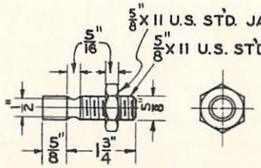
S-2185-9 CAP
CAST IRON
SCALE ②



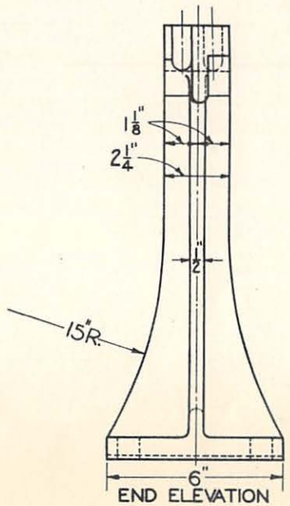
S-2185-10 PLAIN JOURNAL
MALLEABLE IRON
SCALE ②



S-2185-11 THRUST JOURNAL
MALLEABLE IRON
SCALE ②



S-2185-12 SET SCREW
FORGED STEEL
SCALE ②



END ELEVATION

NOTE

ALL PARTS EXCEPT THREADS AND BEARING SURFACES SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
① 0 1 2 3 4 5 6 7 8
② 0 1 2 3 4 5 6

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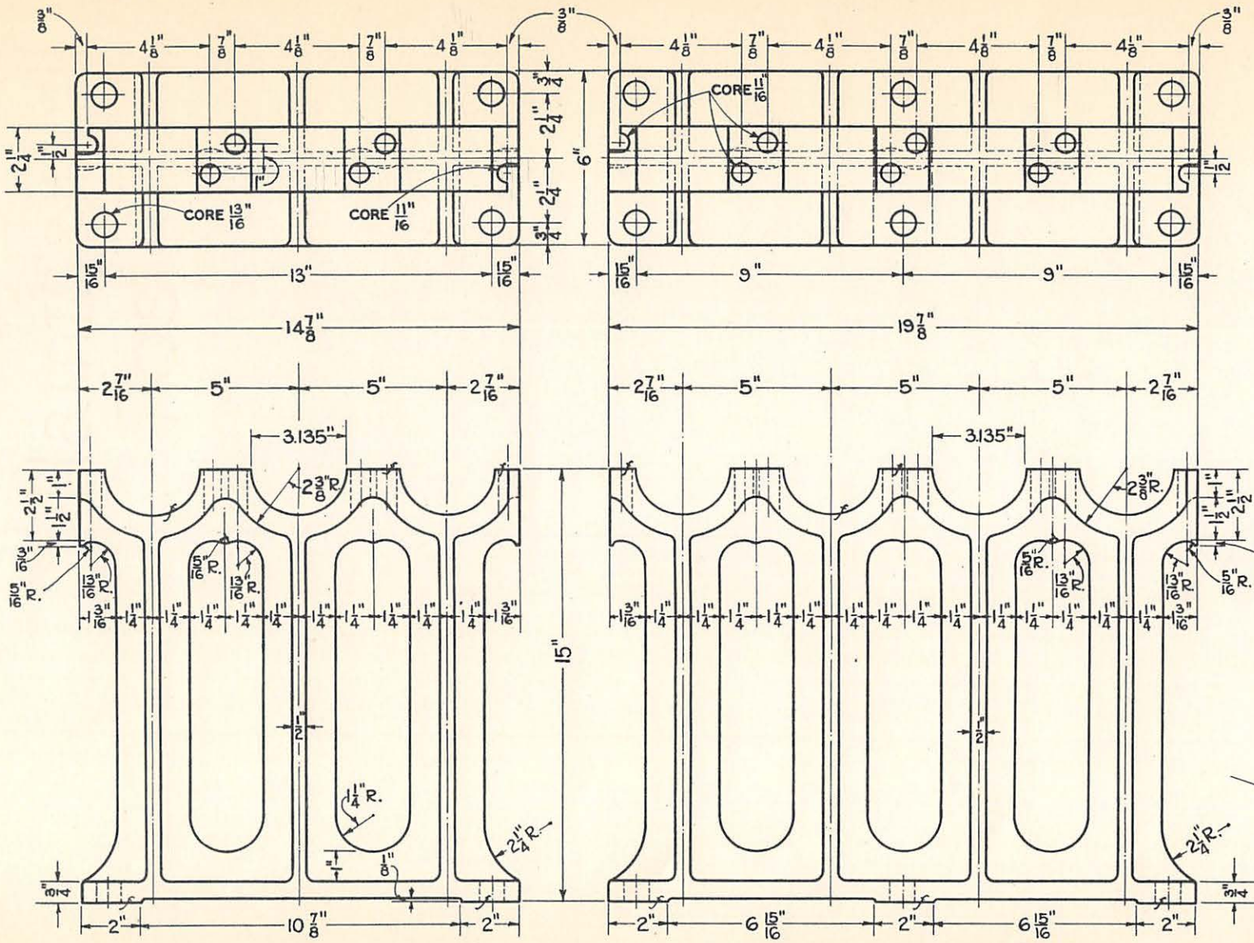
STANDARD ROCKING SHAFT BEARINGS

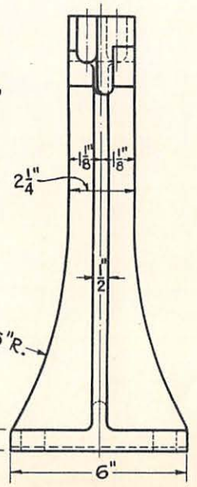
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: NOV. 17, 1931
CHIEF ENGINEER

SHEET 2 OF 3
S-2185

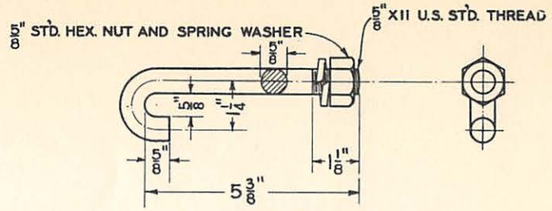


S-2185-15 THREE WAY STAND
CAST IRON
SCALE ①

S-2185-16 FOUR WAY STAND
CAST IRON
SCALE ①



END ELEVATION



S-2185-17 HOOK BOLT
O.-H. STEEL
SCALE ②

NOTE

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SCALE IN INCHES
① 0 1 2 3 4 5 6 7 8
② 0 1 2 3 4 5 6

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STANDARD ROCKING SHAFT BEARINGS

APPROVED BY
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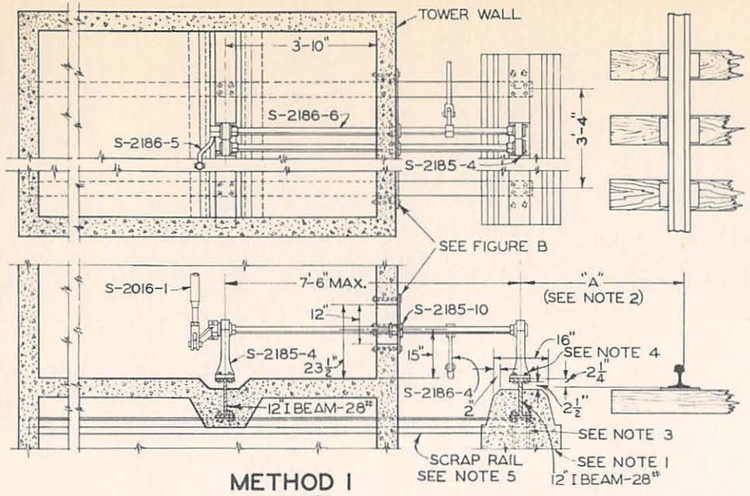
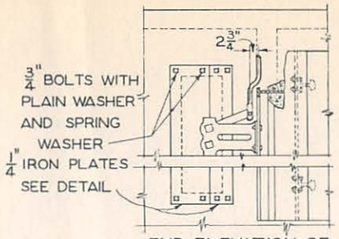
APPROVED: NOV. 17, 1931.
CHIEF ENGINEER

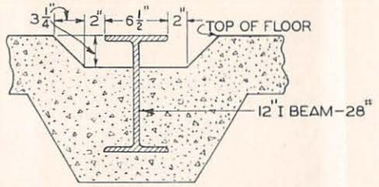
SHEET 3 OF 3
S-2185



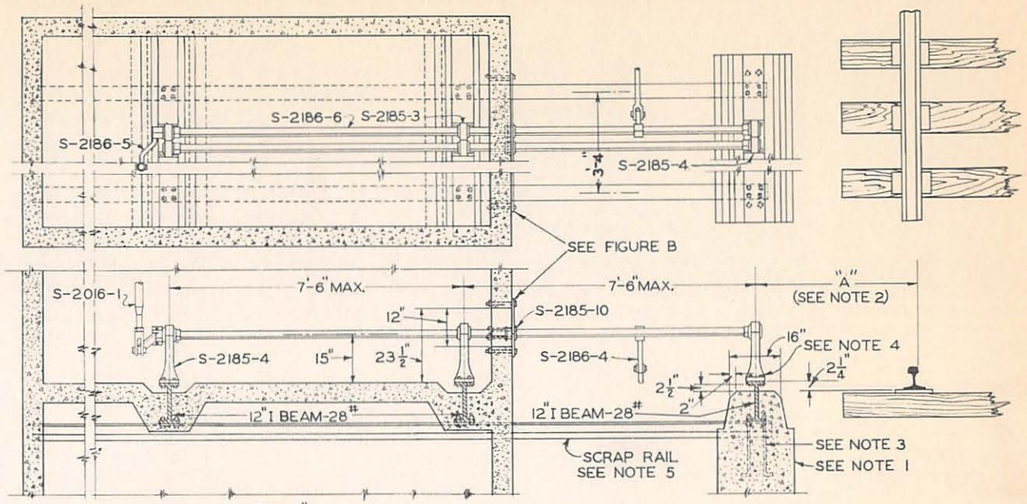
METHOD 1
SCALE ②



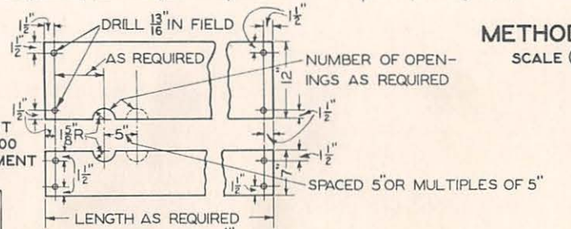
END ELEVATION OF
METHODS 1 AND 3



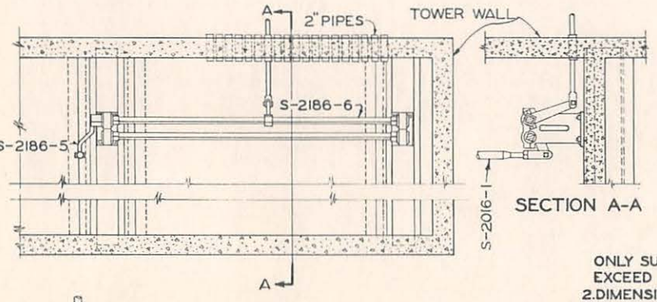
DETAIL SHOWING CONCRETE
CONSTRUCTION AROUND I BEAM
NO SCALE



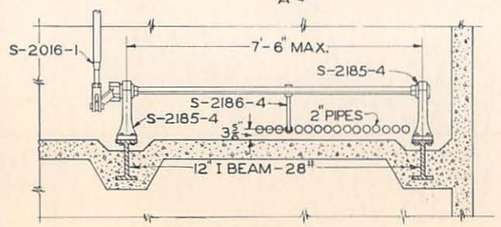
METHOD 3
SCALE ②



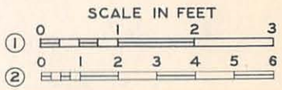
TYPICAL DETAIL OF ¼" PLATES
FIGURE B
SCALE ①



SECTION A-A



METHOD 2
SCALE ②



NOTES

1. LEADOUT FOUNDATIONS SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 2500 POUNDS PER SQUARE INCH OR, IF BY LOOSE VOLUME MEASUREMENT OF AGGREGATES, THE PROPORTIONS SHALL BE AS FOLLOWS:

SIZE OF STONE	MINIMUM BAGS OF CEMENT PER CUBIC YARD OF CONCRETE	APPROXIMATE MIX PROPORTIONS
LARGER THAN 1"	6.0	1 — 2½ — 3½
BETWEEN ¾" AND 1"	6.5	1 — 2½ — 3
SMALLER THAN ¾"	7.0	1 — 2½ — 2½

ONLY SUFFICIENT WATER SHALL BE USED TO OBTAIN A WORKABLE CONSISTENCY. STONE IN AGGREGATE SHALL NOT EXCEED 1½". FOUNDATIONS SHALL HAVE A BATTER OF 2" TO 1'-0", TO A POINT 2" BELOW GROUND LINE.

2. DIMENSION "A" SHALL BE NOT LESS THAN 4'-1 7/16" IN ALL STATES WITH THE EXCEPTION OF OHIO, WHERE DIMENSION "A" SHALL BE NOT LESS THAN 5'-9 5/16".
3. TWO S-2038-2, ¾" X 18" HOOK BOLTS SHALL BE SET 6" FROM EITHER END OF I BEAM IN FOUNDATION.
4. ROCKING SHAFT BEARINGS AND SCRAP RAILS SHALL BE SECURED TO I BEAM WITH ¾" X 2¼" SQUARE HEAD BOLT, HEXAGON NUT, AND SPRING WASHER.
5. TWO SCRAP RAILS AS SHOWN SHALL BE USED WHEN LEADOUT IS FOR EIGHT LEVER SECTION. AN ADDITIONAL RAIL PROPERLY ANCHORED AND SUPPORTED SHALL BE USED FOR EACH ADDITIONAL SECTION.
6. FIELD FORCES SHALL PAINT ALL METAL SURFACES, EXCEPT GALVANIZED PARTS AND BEARING SURFACES, IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

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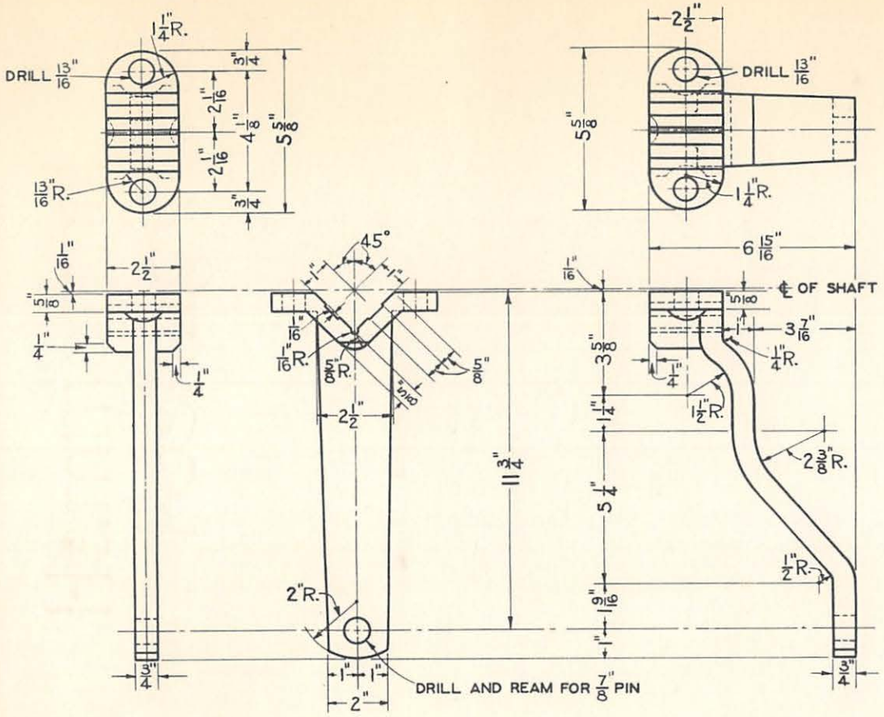
STANDARD ROCKING SHAFT LEADOUTS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: W. W. Mitchell CHIEF ENGINEER DEC. 15, 1932.

S-2187

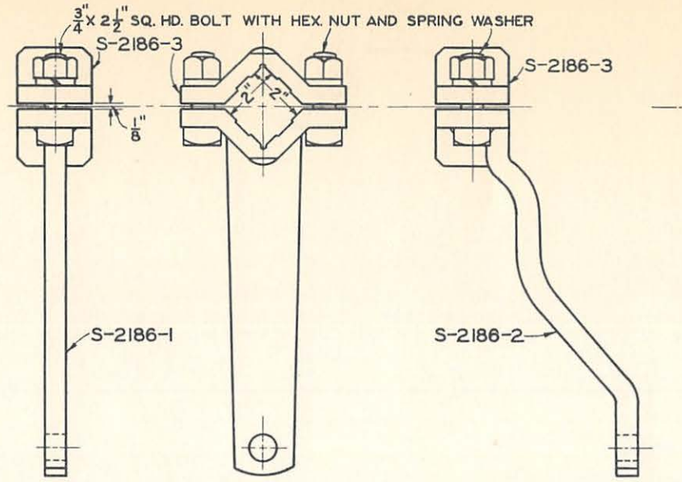


S-2186-1 STRAIGHT ARM

FORGED MILD STEEL.

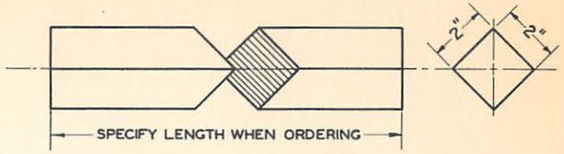
S-2186-2 BENT ARM

FORGED MILD STEEL



S-2186-4 STRAIGHT ARM COMPLETE

S-2186-5 BENT ARM COMPLETE

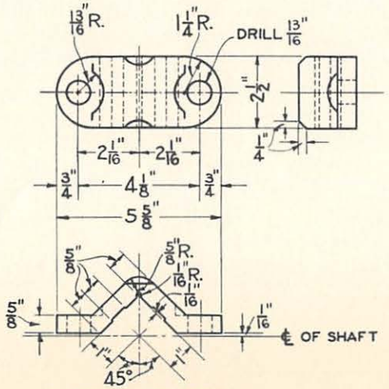


S-2186-6 ROCKING SHAFT

COLD ROLLED STEEL

NOTE

ALL PARTS EXCEPT THREADS AND PIN HOLES SHALL BE FURNISHED PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



S-2186-3 CAP

FORGED MILD STEEL

SCALE IN INCHES

0 1 2 3 4 5 6 7 8

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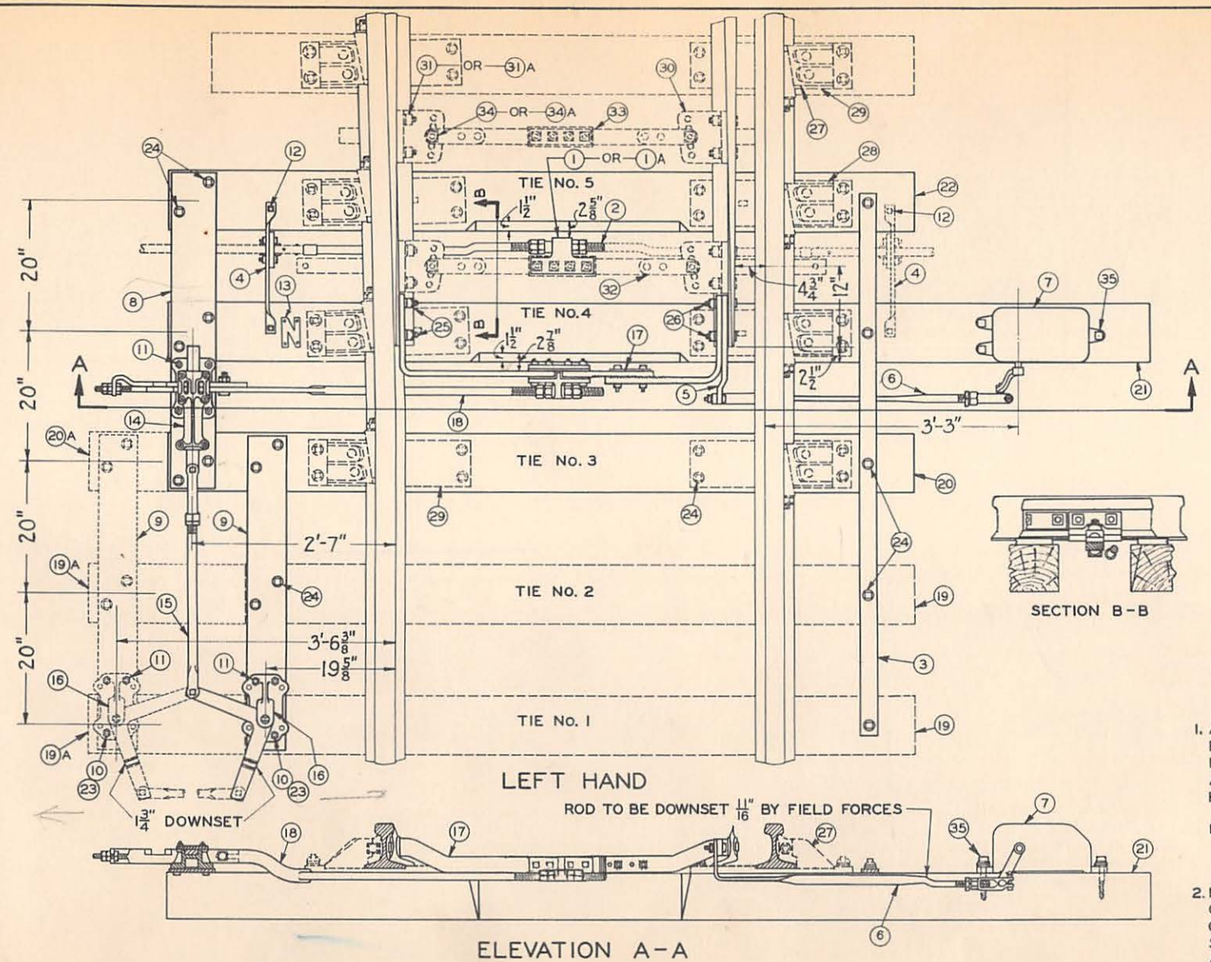
STANDARD ROCKING SHAFT AND ARMS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: NOV. 17, 1931.
CHIEF ENGINEER

S-2186



BILL OF MATERIAL

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(1)	SWITCH ADJUSTMENT BRACKET, OPEN TYPE, COMPLETE WITH SLEEVE AND JAM NUTS	1	S-2301-11
OR (1)A	" " " ENCLOSED TYPE, " " " " " "	1	———
(2)	OPERATING ROD, TANG END, 3'-9" LONG	1	S-2301-9
(3)	TIE STRAP, 3/4" x 2 1/2" x 6'-11"	1	S-2301-21
(4)	TRANSVERSE PIPE CARRIER	1	S-2177-7
(5)	POINT LUG, SEE DRILLING TABLE, SHEET 2	1	S-2306-
(6)	SWITCH CIRCUIT CONTROLLER ROD, COMPLETE WITH SCREW JAW AND BOLTS	1	S-2306-2
(7)	SWITCH CIRCUIT CONTROLLER	1	———
(8)	PLUNGER LOCK PLATE, 1/2" x 7" x 4'-0"	1	S-2301-17
(9)	CRANK PLATE, 1/2" x 6" x 4'-0"	1	S-2301-18
(10)	3/4" x 12" MACHINE STUD BOLT WITH HEX. NUT, SQ. NUT, AND SPRING WASHER	2	S-2301-20
(11)	3/4" x 2 1/4" SQUARE HEAD MACHINE BOLT WITH HEX. NUT AND SPRING WASHER	6	———
(12)	3/4" x 4 1/2" HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS	2	———
(13)	LETTER PLATE "N" WITH 2 1/2"-#8 FLAT HEAD WOOD SCREWS	1	S-2308-1
(14)	SWITCH PLUNGER LOCK, COMPLETE	1	S-2305-4
(15)	PLUNGER LINK, COMPLETE WITH SCREW JAW, PINS AND COTTERS	1	S-2006-1
(16)	CRANK AND STAND COMPLETE	1	S-2182-1
(17)	FRONT ROD COMPLETE, SEE DETAIL DRAWINGS	1	S-2307-
(18)	L. H. LOCK ROD, COMPLETE WITH LOCK PLATE, BOLT AND NUTS	1	S-2301-7
(19)	No. 1 AND 2 SAWED, TREATED, TIE 7" x 9" x 8'-6"		
OR (19)A	" " " " " " 7" x 9" x 10'-6"	2	———
(20)	No. 3 " " " " 7" x 9" x 9'-6"		
OR (20)A	" " " " " " 7" x 9" x 10'-6"	1	———
(21)	No. 4 " " " " 7" x 9" x 12'-6"	1	S-2301-15
(22)	No. 5 " " " " 7" x 9" x 9'-6"	1	S-2301-13
(23)	CAST IRON WASHER	2	S-2301-19
(24)	LAG SCREW AND SPRING WASHER	15	R-523
(25)	BOLT, SPECIFY SIZE, SEE DETAILED DRAWINGS, SHEET 1	2	S-2307-
(26)	" " " " " " " "	2	S-2307-
(35)	3/4" x 6" HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS, WITH SPRING WASHER (R-523), AND FLAT WASHER	3	———

NOTES

1. AFTER STARTING, LAG SCREWS SHALL BE SCREWED DOWN THEIR ENTIRE LENGTH INTO HOLES CONTAINING A SMALL AMOUNT OF CREOSOTE. HOLES SHALL BE BORED AS FOLLOWS:

DIA. OF LAG SCREW	SIZE BIT	APPROX. DEPTH
7/8"	5/8"	5 3/4"
3/4"	9/16"	3"

2. LAYOUT SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
0 6 12 24 36

OTHER TRACK MATERIAL WHICH MAY BE REQUIRED

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(24)	LAG SCREW AND SPRING WASHER	32	R-523
(27)	RAIL BRACE (SPECIFY WEIGHT OF RAIL)	8	R-700
(28)	SLIDE PLATE S-1-A	4	SEE R DRAWINGS FOR LAYOUTS
(29)	" " S-1	4	
(30)	TRANSIT CLIP	4	
(31)	1" x 4 1/2" BOLT WITH NUT, WASHER AND COTTER	8	

OTHER TRACK MATERIAL WHICH MAY BE REQUIRED

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
OR (31)A	3/4" x 3 3/4" BOLT WITH NUT, WASHER AND COTTER	8	SEE R DRAWINGS FOR LAYOUTS
(32)	No. 1 HEAD ROD, INSULATED	1	
(33)	No. 2 ROD, INSULATED	1	
(34)	1 1/8" x 5" BOLT WITH NUT, WASHER AND COTTER	4	
OR (34)A	1" x 4 1/4" BOLT WITH NUT, WASHER AND COTTER	4	

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STANDARD

LAYOUT FOR MECHANICAL SWITCH MECHANISM

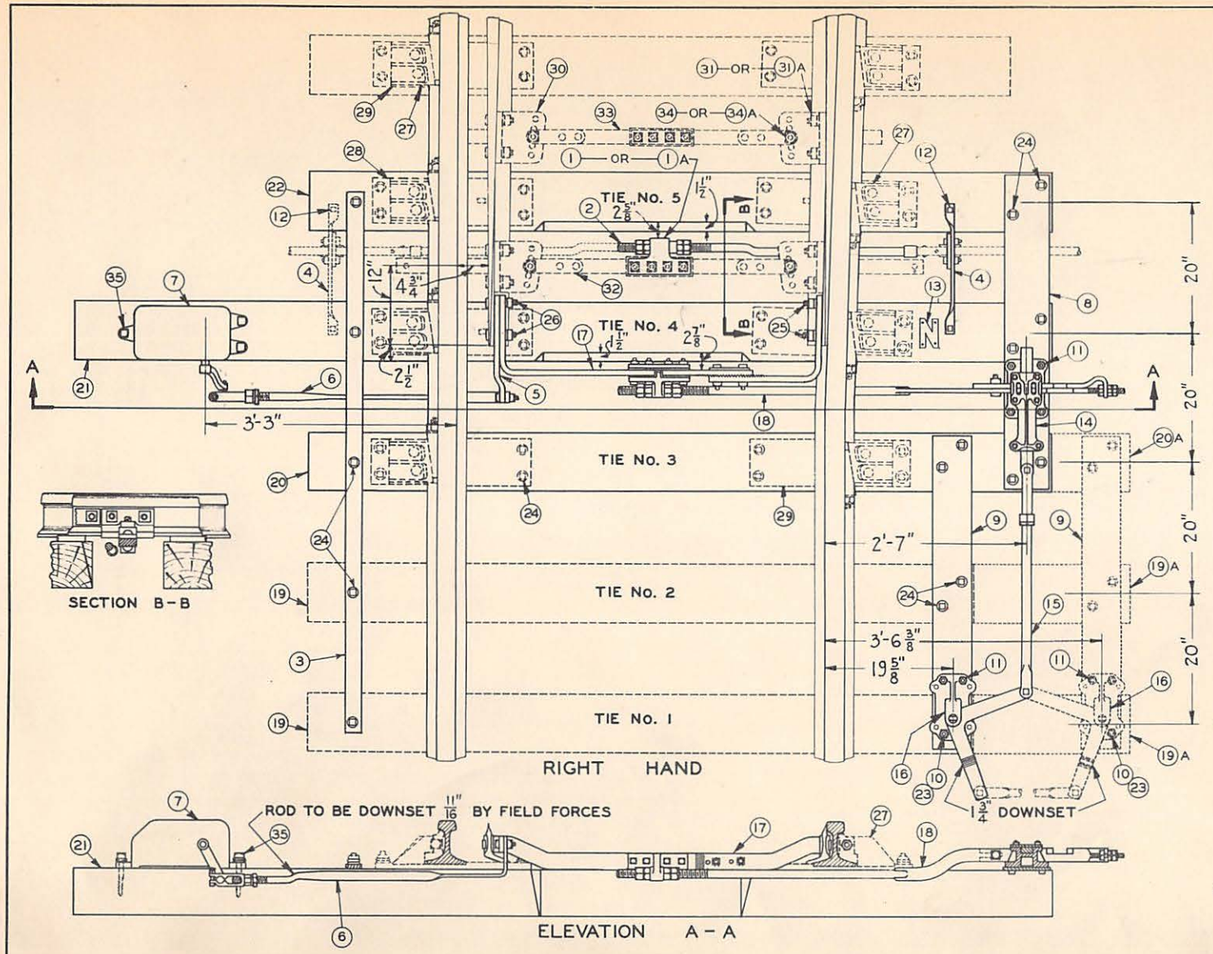
FOR SINGLE SWITCH

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: JUNE 18, 1935
CHIEF ENGINEER

SHEET 1 OF 5

S-2301-A



BILL OF MATERIAL

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(1)	SWITCH ADJUSTMENT BRACKET, OPEN TYPE, COMPLETE WITH SLEEVE AND JAM NUTS	1	S-2301-11
OR (1)A	" " " ENCLOSED TYPE, " " " " " "	1	———
(2)	OPERATING ROD, TANG END, 3'-9" LONG	1	S-2301-9
(3)	TIE STRAP, 3/4" x 2 1/2" x 6'-11"	1	S-2301-21
(4)	TRANSVERSE PIPE CARRIER	1	S-2177-7
(5)	POINT LUG, SEE DRILLING TABLE, SHEET 2	1	S-2306-
(6)	SWITCH CIRCUIT CONTROLLER ROD, COMPLETE WITH SCREW JAW AND BOLTS	1	S-2306-2
(7)	SWITCH CIRCUIT CONTROLLER	1	———
(8)	PLUNGER LOCK PLATE, 1/4" x 7" x 4'-0"	1	S-2301-17
(9)	CRANK PLATE, 1/2" x 6" x 4'-0"	1	S-2301-18
(10)	3/4" x 12" MACHINE STUD BOLT WITH HEX. NUT, SQUARE NUT, AND SPRING WASHER	2	S-2301-20
(11)	3/4" x 2 1/4" SQUARE HEAD MACHINE BOLT WITH HEX. NUT AND SPRING WASHER	6	———
(12)	3/4" x 4 1/2" HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS	2	———
(13)	LETTER PLATE "N" WITH 2 1/2"-#8 FLAT HEAD WOOD SCREWS	1	S-2308-1
(14)	SWITCH PLUNGER LOCK, COMPLETE	1	S-2305-4
(15)	PLUNGER LINK, COMPLETE WITH SCREW JAW, PINS AND COTTERS	1	S-2006-1
(16)	CRANK AND STAND COMPLETE	1	S-2182-1
(17)	FRONT ROD COMPLETE, SEE DETAIL DRAWINGS	1	S-2307-
(18)	R. H. LOCK ROD, COMPLETE WITH LOCK PLATE, BOLT AND NUTS	1	S-2301-8
(19)	NO. 1 AND 2 SAWED, TREATED, TIE 7" x 9" x 8'-6"		
OR (19)A	" " " " " " " 7" x 9" x 10'-6"	2	———
(20)	NO. 3 " " " 7" x 9" x 9'-6"		
OR (20)A	" " " " " " 7" x 9" x 10'-6"	1	———
(21)	NO. 4 " " " 7" x 9" x 12'-6"	1	S-2301-16
(22)	NO. 5 " " " 7" x 9" x 9'-6"	1	S-2301-14
(23)	CAST IRON WASHER	2	S-2301-19
(24)	LAG SCREW AND SPRING WASHER	15	R-523
(25)	BOLT, SPECIFY SIZE, SEE DETAILED DRAWINGS, SHEET 1	2	S-2307-
(26)	" " " " " " " " "	2	S-2307-
(35)	3/4" x 6" HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS, WITH SPRING WASHER (R-523), AND FLAT WASHER	3	———

NOTES

1. AFTER STARTING, LAG SCREWS SHALL BE SCREWED DOWN THEIR ENTIRE LENGTH INTO HOLES CONTAINING A SMALL AMOUNT OF CREOSOTE. HOLES SHALL BE BORED AS FOLLOWS:

DIA. OF LAG SCREW	SIZE BIT	APPROX. DEPTH
7/8"	5/8"	5 3/4"
3/4"	9/16"	3"

2. LAYOUT SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
0 6 12 24 36

OTHER TRACK MATERIAL WHICH MAY BE REQUIRED

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(24)	LAG SCREW AND SPRING WASHER	32	R-523
(27)	RAIL BRACE (SPECIFY WEIGHT OF RAIL)	8	R-700
(28)	SLIDE PLATE S-1-A	4	SEE R DRAWINGS FOR LAYOUTS
(29)	" " S-1	4	
(30)	TRANSIT CLIP	4	
(31)	1" x 4 1/2" BOLT WITH NUT, WASHER AND COTTER	8	

OTHER TRACK MATERIAL WHICH MAY BE REQUIRED

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
OR (31)A	3/4" x 3 3/4" BOLT WITH NUT, WASHER AND COTTER	8	SEE R DRAWINGS FOR LAYOUTS
(32)	NO. 1 HEAD ROD, INSULATED	1	
(33)	NO. 2 ROD, INSULATED	1	
(34)	1 1/8" x 5" BOLT WITH NUT, WASHER AND COTTER	4	
OR (34)A	1" x 4 1/4" BOLT WITH NUT, WASHER AND COTTER	4	

APPROVED FOR USE

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ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

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THE NEW YORK CHICAGO AND ST. LOUIS RAILROAD COMPANY
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STANDARD

LAYOUT FOR MECHANICAL SWITCH MECHANISM

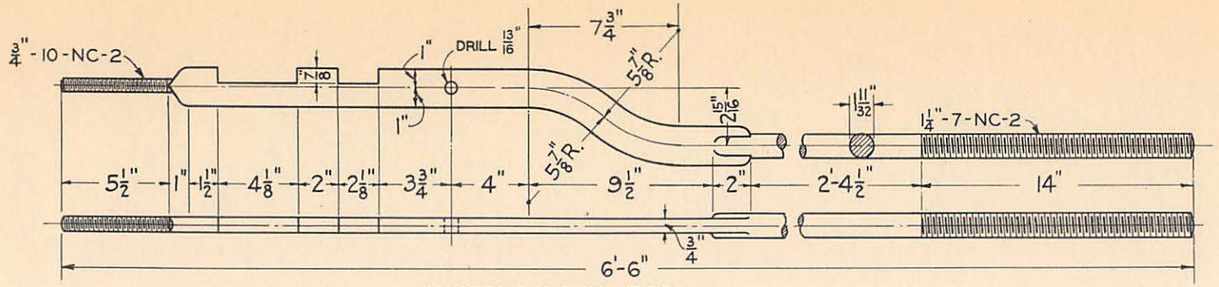
FOR SINGLE SWITCH

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: JUNE 18, 1935
CHIEF ENGINEER

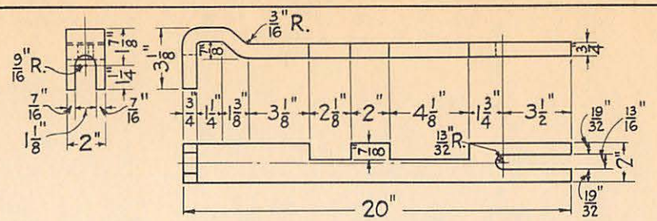
SHEET 2 OF 5

S-2301-A



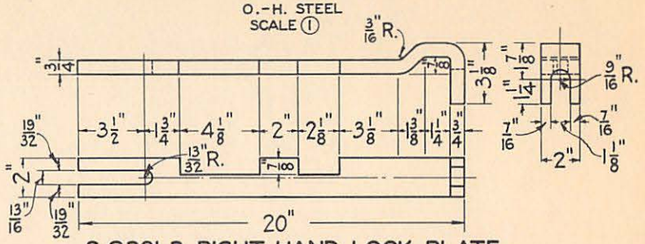
S-2301-1 LOCK ROD ONLY

O.-H. STEEL
SCALE ①



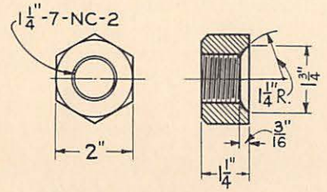
S-2301-2 LEFT HAND LOCK PLATE

O.-H. STEEL
SCALE ①



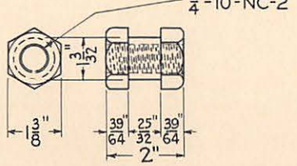
S-2301-3 RIGHT HAND LOCK PLATE

O.-H. STEEL
SCALE ①



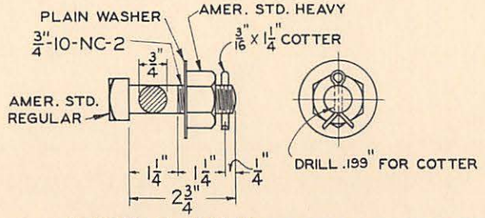
S-2301-4 NUT

O.-H. STEEL
SCALE ②



S-2301-5 SPECIAL NUT

C.R. STEEL
SCALE ②

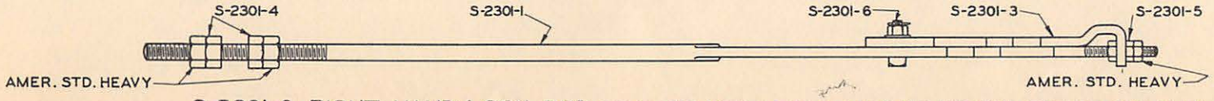


S-2301-6 BOLT COMPLETE WITH HEX. NUT, FLAT WASHER, AND COTTER

O.-H. STEEL
SCALE ②

S-2301-7 LEFT HAND LOCK ROD COMPLETE WITH LOCK PLATE, BOLT, WASHER, COTTER, AND NUTS

SCALE ③



S-2301-8 RIGHT HAND LOCK ROD COMPLETE WITH LOCK PLATE, BOLT, WASHER, COTTER, AND NUTS

SCALE ③

NOTE

ALL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES

① 0 1 2 3 4 5 6 7 8 9 10 11 12

② 0 1 2 3 4 5 6

③ 0 1 3 6 9 12 15 18

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VICE PRESIDENT

ERIE RAILROAD COMPANY
R Ellwoodcuff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Brooks
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
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STANDARD

LAYOUT FOR MECHANICAL SWITCH MECHANISM

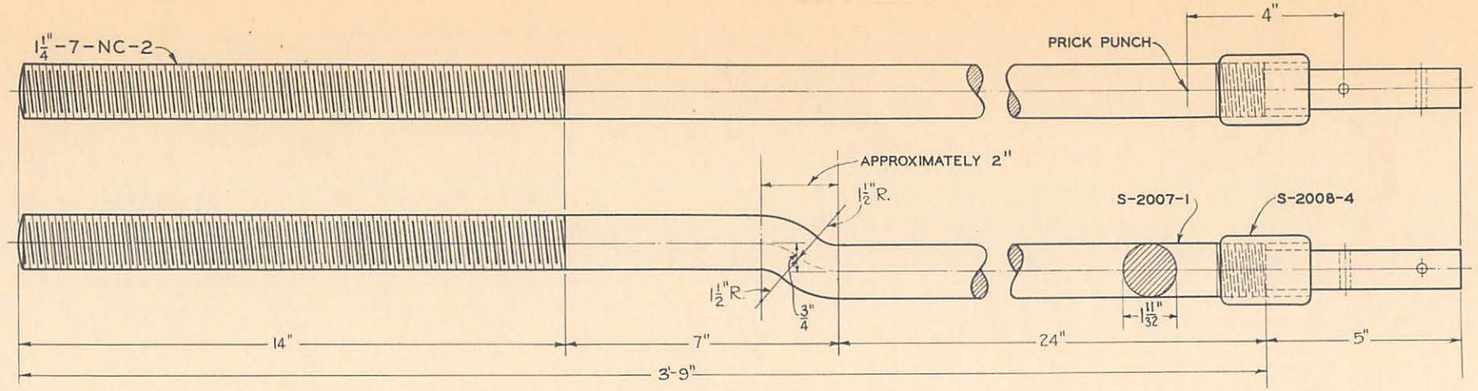
FOR SINGLE SWITCH

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: C Churchill *CHIEF ENGINEER JUNE 18, 1935

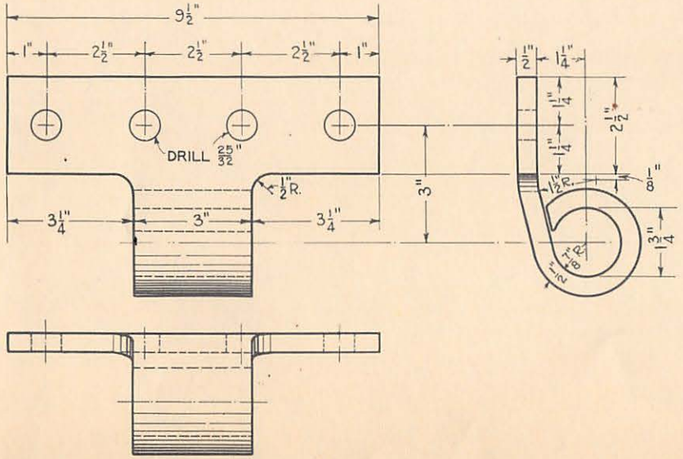
SHEET 3 OF 5

S-2301-A

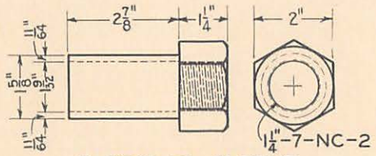


S-2301-9 OPERATING ROD TANG END WITH COUPLING
O.-H. STEEL

NOTE
ALL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



S-2301-10 SWITCH ADJUSTMENT BRACKET ONLY 147665-B8060-34
S-2301-11 SWITCH ADJUSTMENT BRACKET COMPLETE WITH SLEEVE S-2301-12 AND THREE 1¼"-7-NC-2 AMER. STD. HEAVY HEX. NUTS
OPEN-HEARTH STEEL
52196-8265-168



S-2301-12 SLEEVE
MALLEABLE IRON
21117-B8065-10

SCALE IN INCHES
0 1 2 3 4 5 6

APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY	D Brooks, VICE PRESIDENT
ERIE RAILROAD COMPANY	R Kellwoodruff, VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY	D Brooks, VICE PRESIDENT
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FOR SINGLE SWITCH

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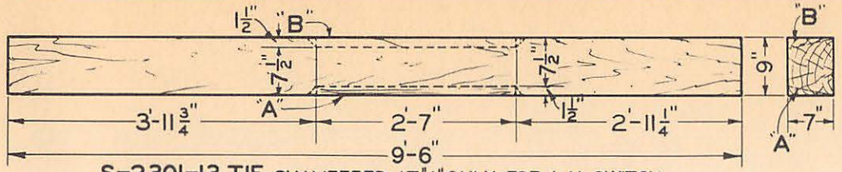
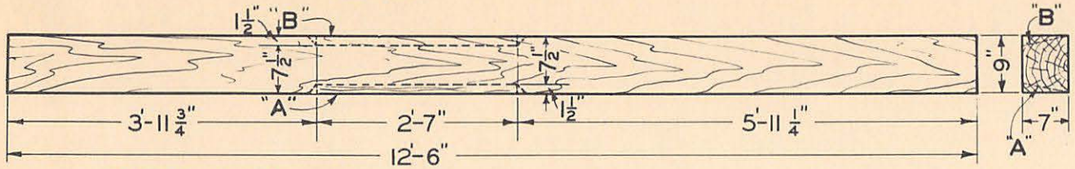
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: A Trimble, CHIEF ENGINEER — JUNE 18, 1935

SHEET 4 OF 5

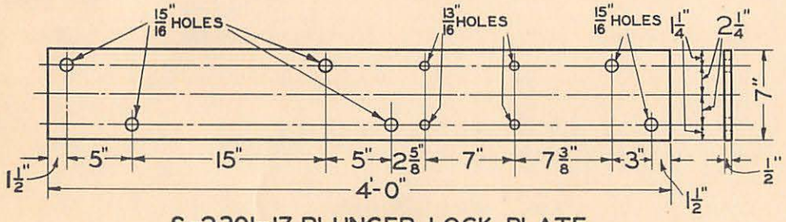
S-2301-A



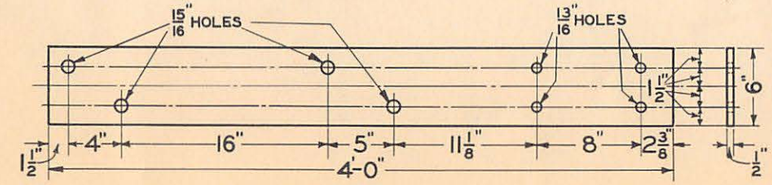
S-2301-13 TIE CHAMFERED AT "A" ONLY FOR L.H. SWITCH
S-2301-14 TIE CHAMFERED AT "B" ONLY FOR R.H. SWITCH
SCALE ①



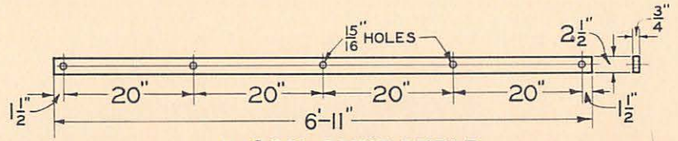
S-2301-15 TIE CHAMFERED AT "A" ONLY FOR L.H. SWITCH
S-2301-16 TIE CHAMFERED AT "B" ONLY FOR R.H. SWITCH
SCALE ①



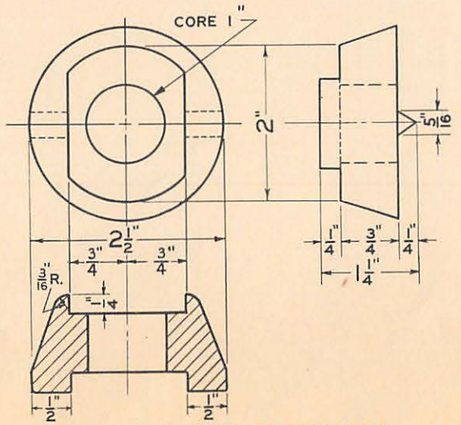
S-2301-17 PLUNGER LOCK PLATE
OPEN-HEARTH STEEL
SCALE ②



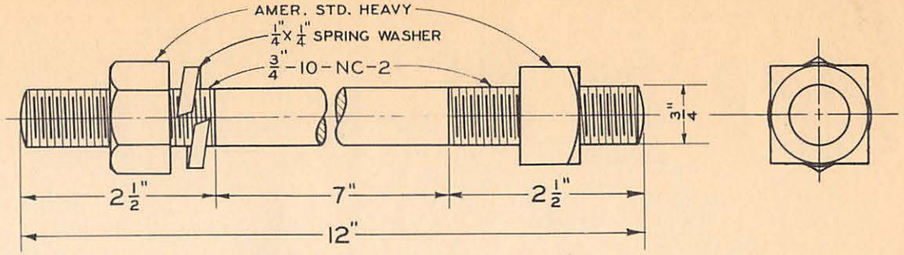
S-2301-18 CRANK PLATE
OPEN-HEARTH STEEL
SCALE ②



S-2301-21 TIE STRAP
OPEN-HEARTH STEEL
SCALE ①



S-2301-19 CAST IRON WASHER
FOR ¾" OR ⅞" AMER. STD. HEAVY SQ. NUTS
SCALE ③



S-2301-20 STUD BOLT
OPEN-HEARTH STEEL
SCALE ③

NOTES

1. PLUNGER LOCK PLATE, CRANK PLATE, AND TIE STRAP, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. TIES SHALL BE FURNISHED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-2, SWITCH TIES, AND SHALL BE TREATED, AFTER FRAMING, IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-17, PRESERVATIVE TREATMENT OF CROSS TIES OR SWITCH TIES.

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ERIE RAILROAD COMPANY — E E Woodruff, VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D B Brooke, VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — A J Bowman, VICE PRESIDENT		
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K.L.M.		

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STANDARD

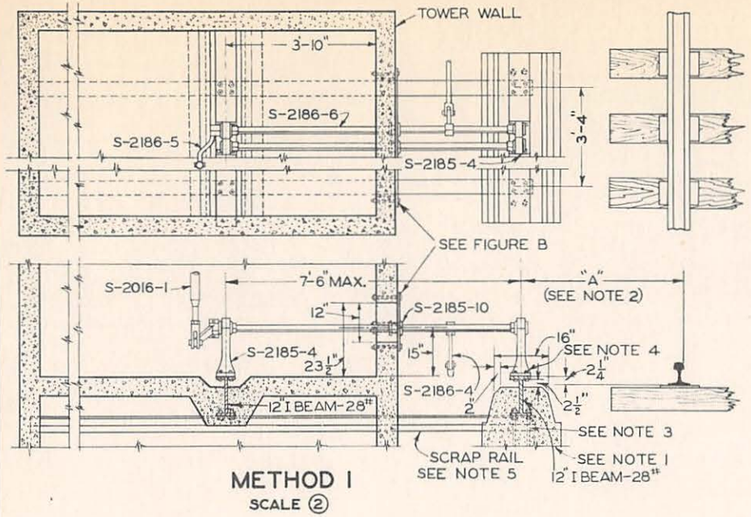
LAYOUT FOR MECHANICAL SWITCH MECHANISM

FOR SINGLE SWITCH

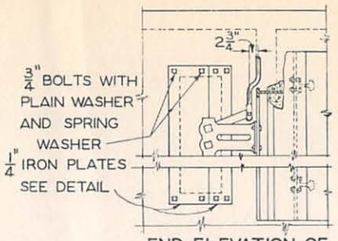
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E W Kendall, CHIEF ENGINEER
JUNE 18, 1935

SHEET 5 OF 5

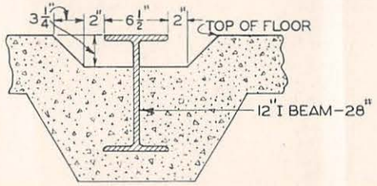
S-2301-A



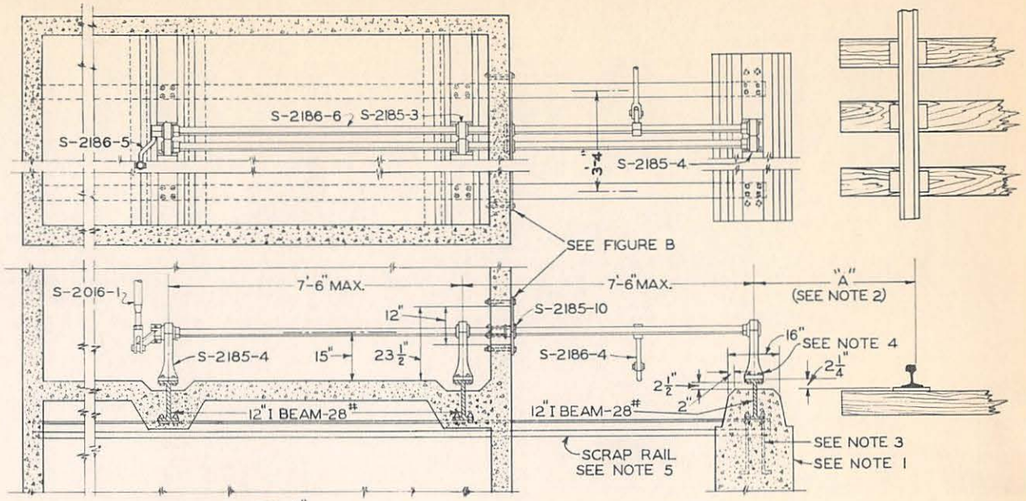
METHOD 1
SCALE ②



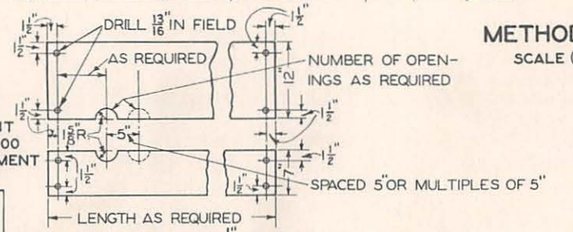
END ELEVATION OF METHODS 1 AND 3



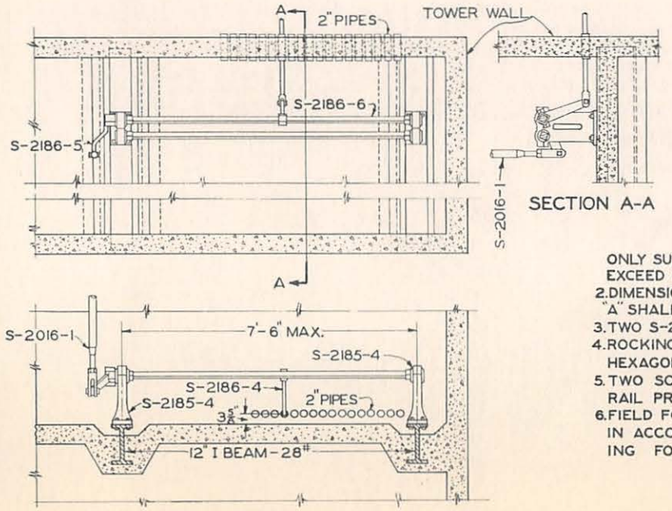
DETAIL SHOWING CONCRETE CONSTRUCTION AROUND I BEAM
NO SCALE



METHOD 3
SCALE ②



TYPICAL DETAIL OF ¼" PLATES
FIGURE B
SCALE ①



METHOD 2
SCALE ②

SCALE IN FEET
① 0 1 2 3
② 0 1 2 3 4 5 6

NOTES

1. LEADOUT FOUNDATIONS SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 2500 POUNDS PER SQUARE INCH OR, IF BY LOOSE VOLUME MEASUREMENT OF AGGREGATES, THE PROPORTIONS SHALL BE AS FOLLOWS:

SIZE OF STONE	MINIMUM BAGS OF CEMENT PER CUBIC YARD OF CONCRETE	APPROXIMATE MIX PROPORTIONS
LARGER THAN 1"	6.0	1 – 2½ – 3½
BETWEEN ¾" AND 1"	6.5	1 – 2½ – 3
SMALLER THAN ¾"	7.0	1 – 2½ – 2½

ONLY SUFFICIENT WATER SHALL BE USED TO OBTAIN A WORKABLE CONSISTENCY. STONE IN AGGREGATE SHALL NOT EXCEED 1½". FOUNDATIONS SHALL HAVE A BATTER OF 2" TO 1'-0", TO A POINT 2" BELOW GROUND LINE.

2. DIMENSION "A" SHALL BE NOT LESS THAN 4'-1 7/8" IN ALL STATES WITH THE EXCEPTION OF OHIO, WHERE DIMENSION "A" SHALL BE NOT LESS THAN 5'-9 5/16".
3. TWO S-2038-2, ¾" X 18" HOOK BOLTS SHALL BE SET 6" FROM EITHER END OF I BEAM IN FOUNDATION.
4. ROCKING SHAFT BEARINGS AND SCRAP RAILS SHALL BE SECURED TO I BEAM WITH ¾" X 2¼" SQUARE HEAD BOLT, HEXAGON NUT, AND SPRING WASHER.
5. TWO SCRAP RAILS AS SHOWN SHALL BE USED WHEN LEADOUT IS FOR EIGHT LEVER SECTION. AN ADDITIONAL RAIL PROPERLY ANCHORED AND SUPPORTED SHALL BE USED FOR EACH ADDITIONAL SECTION.
6. FIELD FORCES SHALL PAINT ALL METAL SURFACES, EXCEPT GALVANIZED PARTS AND BEARING SURFACES, IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

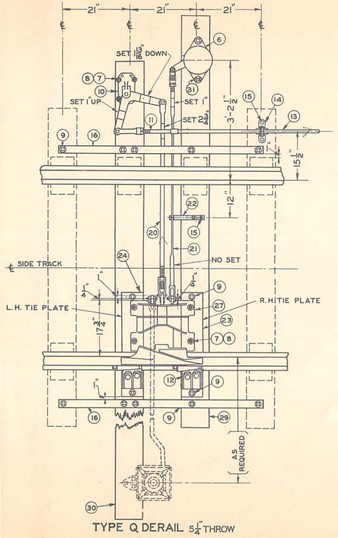
K.L.M. K.L.M. C.D.M. A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

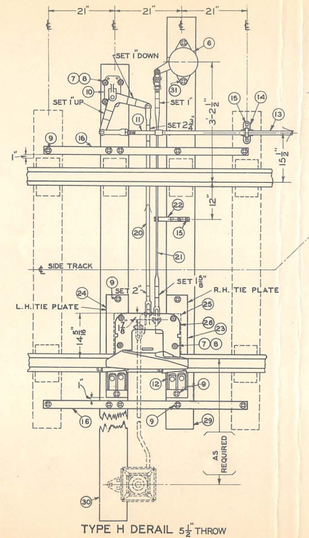
STANDARD ROCKING SHAFT LEADOUTS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: DEC. 15, 1932.
CHIEF ENGINEER

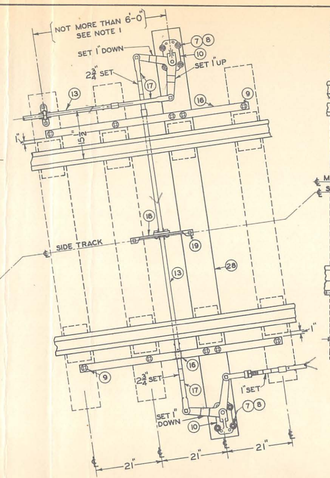
S-2187

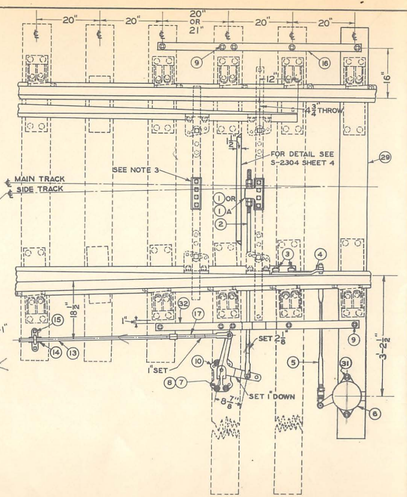


TYPE Q DERAIL 5¼" THROW



TYPE H DERAIL 5½" THROW





BILL OF MATERIAL

FIGURE	DESCRIPTION	QUANTITY	REFERENCES TYPE H DERAIL	REFERENCES TYPE Q DERAIL
(1)	SWITCH ADJUSTMENT BRACKET, OPEN TYPE, COMPLETE WITH SLEEVE AND JAM NUTS	1	S-2301-11	S-2301-11
OR (1)A	" " " ENCLOSED TYPE " " " " " "	1	——	——
(2)	OPERATING ROD, COMPLETE WITH PIN AND COTTER	1	S-2304-4	S-2304-4
(3)	BOLTS, SPECIFY SIZE, SEE DETAILED DRAWINGS, SHEET 2	2	S-2306-	S-2306-
(4)	SWITCH POINT LUG, SEE DRILLING TABLE, DETAILED DRAWINGS, SHEET 2	1	S-2306-	S-2306-
(5)	SWITCH CIRCUIT CONTROLLER ROD, COMPLETE WITH SCREW JAW AND BOLTS	1	S-2306-2	S-2306-2
(6)	SWITCH CIRCUIT CONTROLLER	2	——	——
(7)	⅞"X12" MACHINE STUD BOLT WITH HEX. NUT, SQUARE NUT, AND SPRING WASHER	20	S-2301-20	S-2301-20
(8)	CAST IRON WASHER	20	S-2301-19	S-2301-19
(9)	LAG SCREW AND SPRING WASHER	34	R-523	R-523
(10)	CRANK AND STAND COMPLETE	4	S-2182-1	S-2182-1
(11)	TANG END WITH SCREW JAW	2	S-2006-5	S-2006-5
(12)	RAIL BRACE (ASSEMBLED WITH PLATES FIG. 23 AND 24) SPECIFY WEIGHT OF RAIL	2	R-700	R-700
(13)	I" SIGNAL PIPE	AS REQD.	S-2008-3	S-2008-3
(14)	STRAP PIPE CARRIER	7	S-2176-4	S-2176-4
(15)	½"X 4" HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS	" "	——	——
(16)	TIE STRAP ⅜" X 2½" X 5'-5"	5	S-2304-21	S-2304-21
(17)	STRAIGHT SOLID JAW WITH TANG END	4	S-2007-6	S-2007-6
(18)	TRANSVERSE PIPE CARRIER	1	S-2177-7	S-2177-7
(19)	⅜"X 4½"HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS	2	——	——
(20)	OPERATING ROD COMPLETE	1	S-2304-6	S-2304-24
(21)	CIRCUIT CONTROLLER ROD COMPLETE	1	S-2304-2	S-2304-20
(22)	ROD GUIDE	1	S-2036-8	S-2036-8
(23)	R.H. TIE PLATE SEE DRILLING TABLE SHEET 3	1	S-2304-	S-2304-
(24)	L.H. " " " " " " "	1	S-2304-	S-2304-
(25)	FILLER PLATE REQUIRED FOR USE WITH 112 LB. OR 130 LB. RAIL WITH HP6 DERAIL	2	S-2304-	——
(26)	TYPE H DERAIL MODEL HP6 FOR 110, 112, OR 130 LB. RAIL; MODEL HP7 FOR 131 LB. RAIL, SPECIFY R.H. OR L.H.	1	——	——
(27)	TYPE Q DERAIL WITH MALLEABLE IRON SCREW JAW. SPECIFY R.H. OR L.H.	1	——	——
(28)	SAWED TREATED TIE 7"X9"X11'-0"	1	——	——
(29)	" " " 7"X9"X11'-0"	2	S-2036-3	S-2036-3
(30)	" " " 7"X9"X15'-6"	1	——	——
(31)	⅜" X 6" HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS, WITH SPRING WASHER (R-523), AND FLAT WASHER	4	——	——
(32)	TIE STRAP ⅜" x 2½" x 5'-5"	1	S-2304-18	S-2304-18

IN NON-TRACK CIRCUIT TERRITORY THE FOLLOWING ITEMS SHALL BE OMITTED

FIGURE	DESCRIPTION	QUANTITY	TYPE H DERAIL	TYPE Q DERAIL
(3)	BOLTS	2	S-2306-	S-2306-
(4)	SWITCH POINT LUG	1	S-2306-	S-2306-
(5)	SWITCH CIRCUIT CONTROLLER ROD, COMPLETE WITH SCREW JAW AND BOLTS	1	S-2306-2	S-2306-2
(6)	SWITCH CIRCUIT CONTROLLER	2	——	——
(15)	½"X 4" HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS	2	——	——
(21)	CIRCUIT CONTROLLER ROD COMPLETE	1	S-2304-2	S-2304-20
(22)	ROD GUIDE	1	S-2304-22	S-2304-22
(28)	SAWED TREATED TIE 7"X9"X11'-0"	2	S-2036-3	S-2036-3
(31)	⅜" X 6" HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS, WITH SPRING WASHER (R-523), AND FLAT WASHER	4	——	——

NOTES

1. INTERMEDIATE STRAP PIPE CARRIERS SHALL BE SPACED APPROXIMATELY 6 FEET CENTERS.
2. BILL OF MATERIAL INCLUDES ALL MATERIAL OTHER THAN THAT USUALLY INSTALLED WITH SWITCH.
3. HEAD ROD AND NUMBER 2 ROD IN NON-TRACK CIRCUIT TERRITORY MAY BE INSULATED OR NON-INSULATED AS FURNISHED IN PLACE BY TRACK DEPARTMENT.
4. AFTER STARTING, LAG SCREWS SHALL BE SCREWED DOWN THEIR ENTIRE LENGTH INTO HOLES CONTAINING A SMALL AMOUNT OF CREOSOTE. HOLES SHALL BE BORED AS FOLLOWS:

DIA. OF LAG SCREW	SIZE BIT	APPROX. DEPTH
⅜"	⅜"	5½"
½"	½"	3"
⅝"	⅝"	2½"

5. LAYOUT SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
6. CRANKS SHALL BE LOCATED SO AS TO PROVIDE PROPER COMPENSATION IN ACCORDANCE WITH LATEST REVISION OF STANDARD DRAWING S-2181, STANDARD PIPE COMPENSATION.

SCALE IN FEET
0 2 3

APPROVED FOR USE

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ERIE RAILROAD COMPANY
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THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
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C.H.W. K.L.M. C.D.M. A.J.P.

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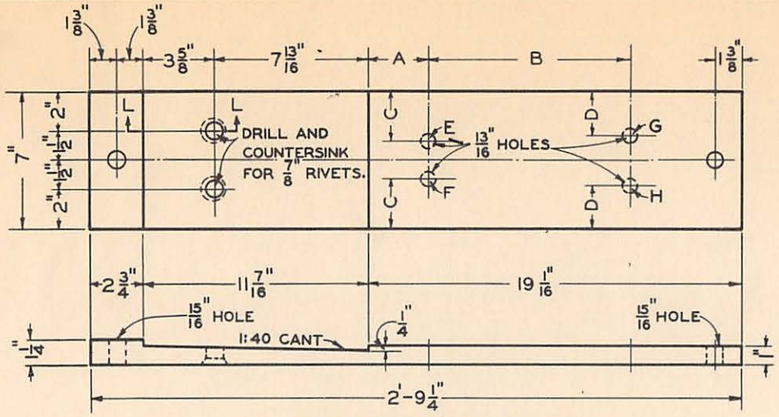
STANDARD NONINTERLOCKED SWITCH CONNECTED DERAIL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 18, 1935
CHIEF ENGINEER

SHEET 1 OF 4

S-2304



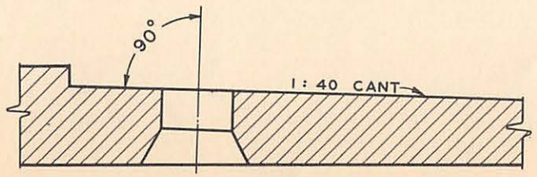
S-2304-7 TIE PLATE

WITHOUT HOLES E, F, G, OR H.

MILD OPEN-HEARTH STEEL

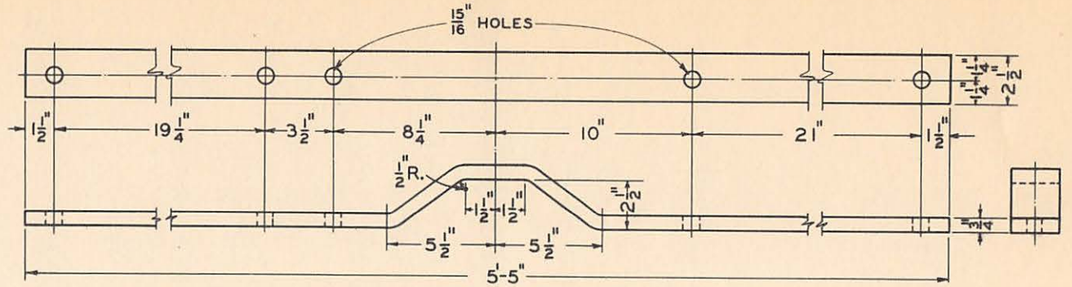
TABLE SHOWING DRILLING FOR TIE PLATE S-2304-7

DWG. NO.	DESCRIPTION	A	B	C	D	DRILL HOLES
S-2304-8	L. H. TIE PLATE FOR TYPE H DERAIL ON 110# AND 112# R. E. RAIL	3"	8 13/16"	2 9/16"	2 1/4"	F AND H
S-2304-9	R. H. " " " " " " " " " " " " "	3"	8 13/16"	2 9/16"	2 1/4"	E " G
S-2304-10	L. H. TIE PLATE FOR TYPE Q DERAIL ON 110# AND 112# R. E. RAIL	3"	10 1/4"	3"	3"	F " H
S-2304-11	R. H. " " " " " " " " " " " " "	3"	10 1/4"	3"	3"	E " G
S-2304-12	L. H. TIE PLATE FOR TYPE Q DERAIL ON 130# AND 131# R. E. RAIL	3"	10 1/4"	3"	3"	F " H
S-2304-13	R. H. " " " " " " " " " " " " "	3"	10 1/4"	3"	3"	E " G
S-2304-14	L. H. TIE PLATE FOR TYPE H DERAIL ON 130# AND 131# R. E. RAIL	2 15/16"	8 13/16"	2 9/16"	2 1/4"	F " H
S-2304-15	R. H. " " " " " " " " " " " " "	2 15/16"	8 13/16"	2 9/16"	2 1/4"	E " G



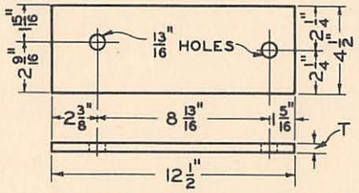
SECTION L-L

NO SCALE



S-2304-18 TIE STRAP

OPEN-HEARTH STEEL



S-2304-16 FILLER PLATE

FOR USE WITH TYPE H DERAIL ON 112# R.E. RAIL (T = 3/8")

S-2304-17 FILLER PLATE

FOR USE WITH TYPE H DERAIL ON 130# R.E. RAIL (T = 1/2")

MILD OPEN-HEARTH STEEL

NOTE

ALL PARTS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES

0 1 2 3 6 9 12

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Bro ooke, VICE PRESIDENT

ERIE RAILROAD COMPANY — R E Woodruff, VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D Bro ooke, VICE PRESIDENT

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C.H.W.		

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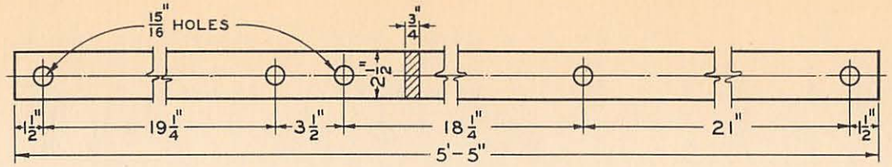
STANDARD
NONINTERLOCKED SWITCH CONNECTED DERAIL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

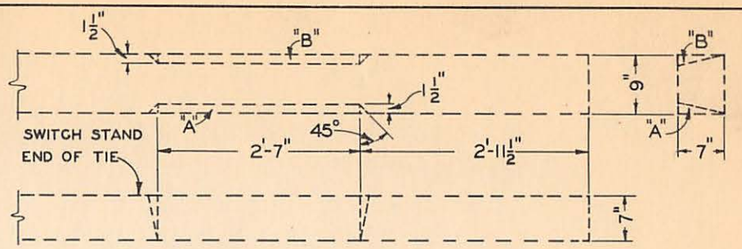
APPROVED: W Winchell, CHIEF ENGINEER — JUNE 18, 1935

SHEET 3 OF 4

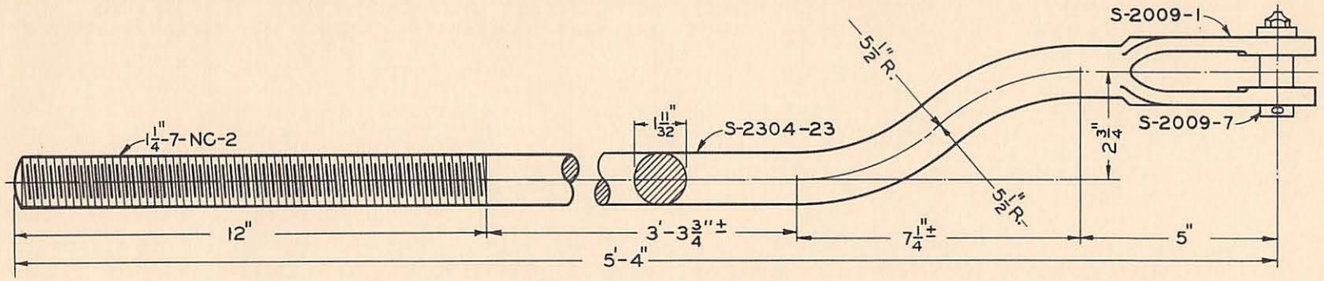
S-2304



S-2304-21 TIE STRAP
OPEN-HEARTH STEEL
SCALE (2)



DETAIL OF FRAMING OF TIE BACK OF HEAD ROD
CHAMFER AT "A" FOR L.H. LAYOUT
CHAMFER AT "B" FOR R.H. LAYOUT
SCALE (3)

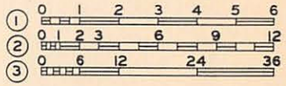


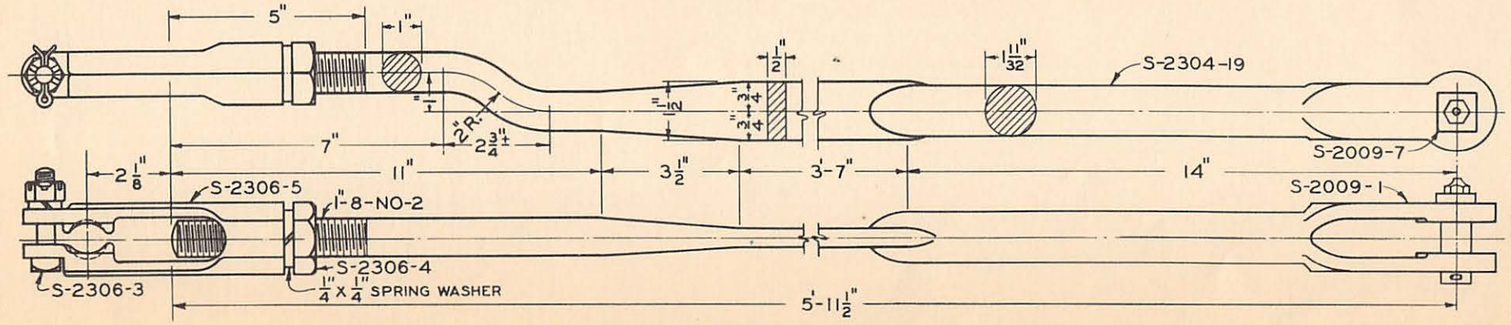
S-2304-23 OPERATING ROD ONLY FOR TYPE "Q" DERAIL
S-2304-24 " " FOR TYPE "Q" DERAIL COMPLETE WITH TWO AMER. STD. HEAVY HEX. NUTS, PIN AND COTTER
OPEN-HEARTH STEEL
SCALE (1)

NOTE

ALL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES





S-2304-19 CIRCUIT CONTROLLER ROD ONLY, FOR TYPE "Q" DERAIL
S-2304-20 " " " FOR TYPE "Q" DERAIL, COMPLETE AS SHOWN
OPEN-HEARTH STEEL
SCALE (1)

APPROVED FOR USE

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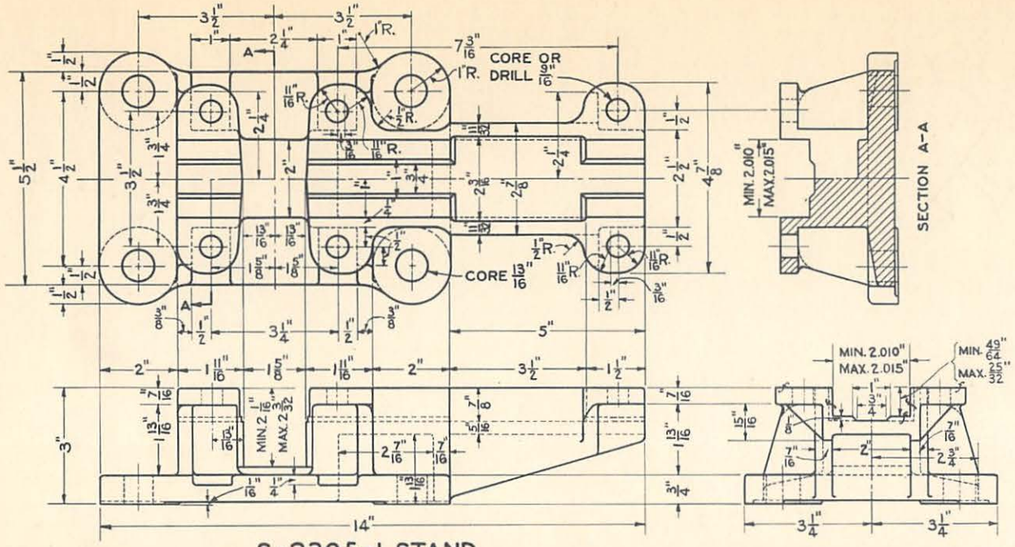
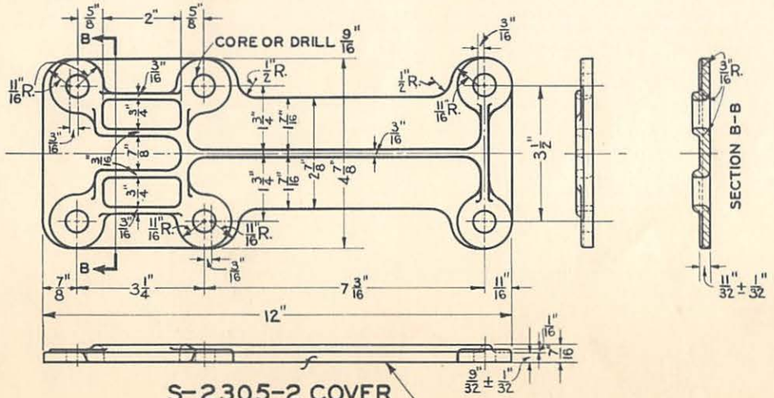
STANDARD
NONINTERLOCKED SWITCH CONNECTED DERAIL

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E T Howard CHIEF ENGINEER
JUNE 18, 1935

SHEET 4 OF 4
S-2304

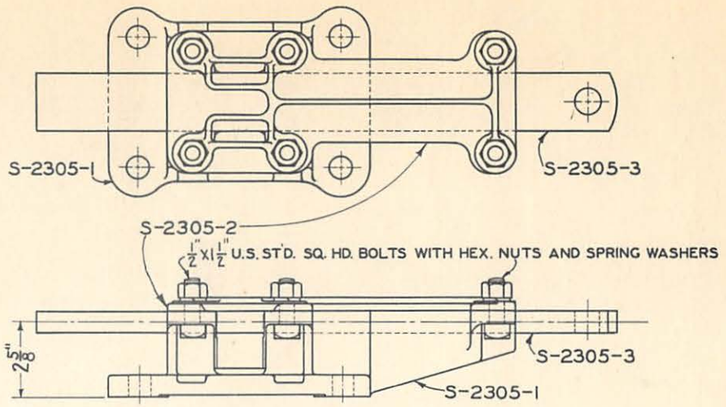


S-2305-1 STAND
CAST IRON
SCALE ①

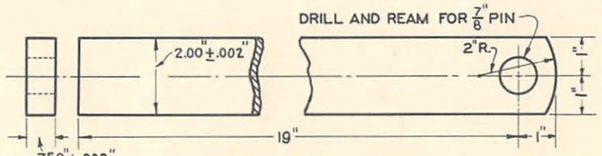


S-2305-2 COVER
MALLEABLE IRON
SCALE ①

THE BOTTOM OF COVER SHALL BE RELIEVED IN ACCORDANCE WITH THE MANUFACTURER'S PRACTICE.



S-2305-4 PLUNGER SWITCH LOCK COMPLETE
SCALE ②



S-2305-3 PLUNGER
COLD ROLLED STEEL
SCALE ①

NOTE

PLUNGER SWITCH LOCK SHALL BE FURNISHED WITH ALL PARTS, EXCEPT BEARING SURFACES, PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
① 0 1 2 3 4 5 6
② 0 1 2 3 4 5 6 7 8

APPROVED FOR USE

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VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

K.L.M.	C.D.M.	A.J.P.
K.L.M.		

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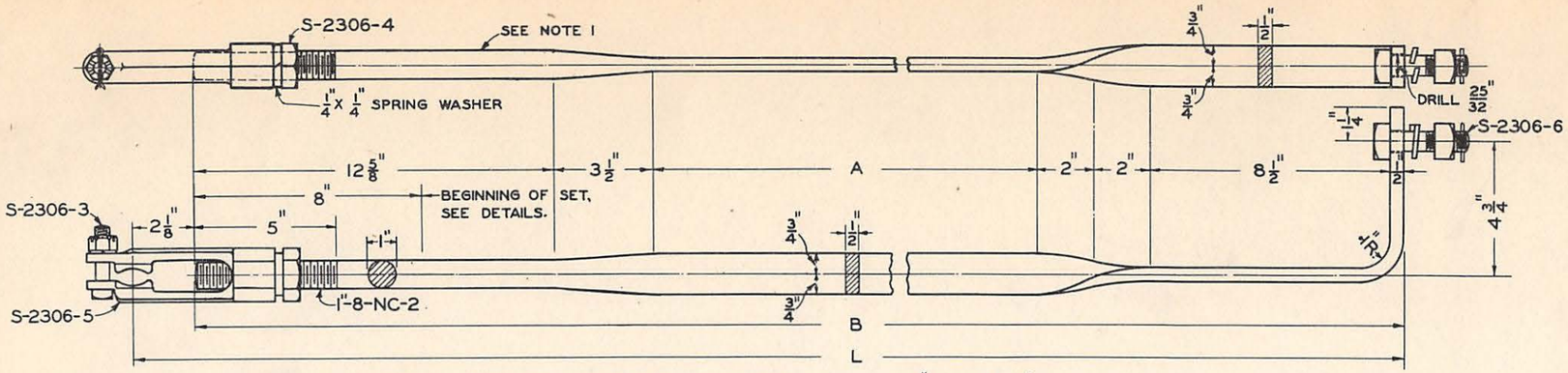
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD PLUNGER SWITCH LOCK

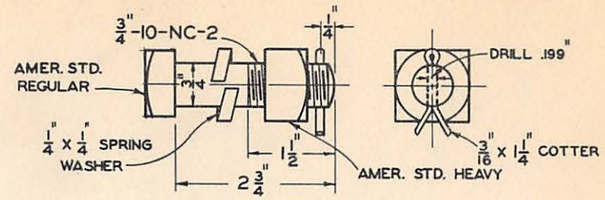
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: _____ JAN. 19, 1932.
CHIEF ENGINEER

S-2305



S-2306-1 SWITCH CIRCUIT CONTROLLER ROD ONLY, A= 13 1/2", B= 3'-6 5/8"
S-2306-2 " " " " COMPLETE AS SHOWN, L=3'-8 3/4".
S-2306-18 " " " " ONLY A=4'-10 5/16", B=7'-3 7/16".
S-2306-19 " " " " COMPLETE AS SHOWN, L=7'-5 9/16".

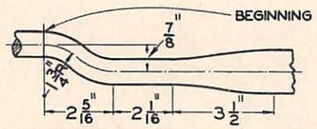
O.-H. STEEL
SCALE ①



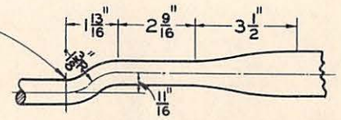
S-2306-6 BOLT COMPLETE
O.-H. STEEL
SCALE ②

NOTES

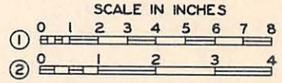
1. ROD SHALL BE UPSET OR DOWNSET BY FIELD FORCES AS REQUIRED.
2. ROD AND JAW EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

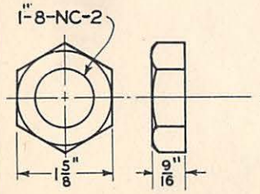


DETAIL OF UPSET IN ROD
FOR ROTARY TYPE CONTROLLER
SCALE ①

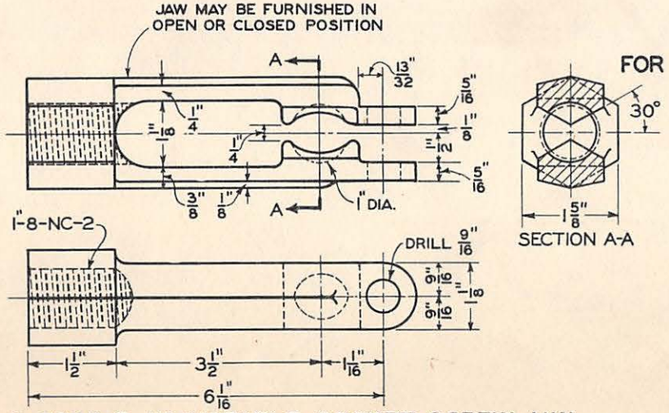


DETAIL OF DOWNSET IN ROD
FOR UNIVERSAL TYPE CONTROLLER
SCALE ①



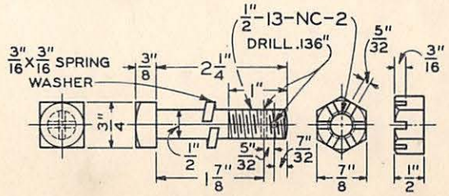


S-2306-4 JAM NUT
O.-H. STEEL
SCALE ②



S-2306-5 ADJUSTABLE SOCKET SCREW JAW ONLY
S-2306-20 " " " " WITH BOLT S-2306-3

MALLEABLE IRON
SCALE ②



S-2306-3 BOLT COMPLETE
WITH NUT, 1/8" x 1 1/4" COTTER, AND SPRING WASHER
O.-H. STEEL
SCALE ②

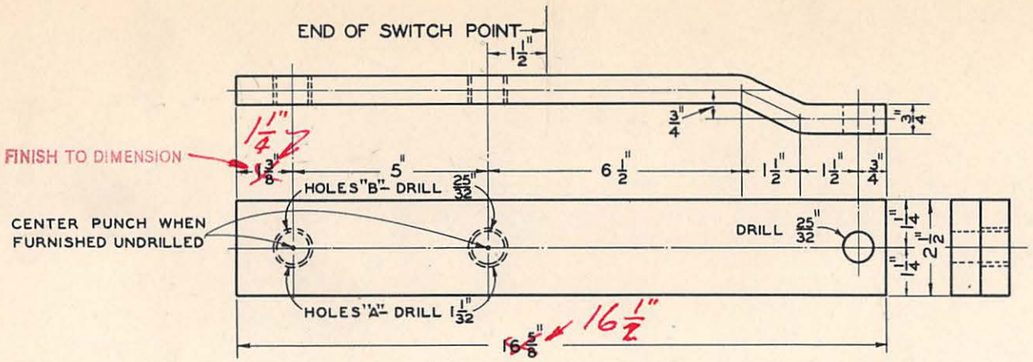
APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT		
C.H.W.	C.D.M.	A.J.P.
C.H.W.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD SWITCH CIRCUIT CONTROLLER ROD

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: OCT. 7, 1935.
CHIEF ENGINEER

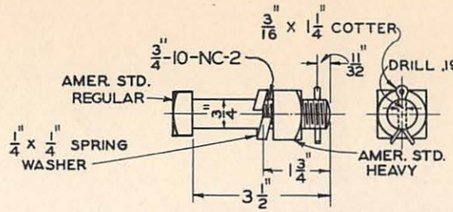
SHEET 1 OF 2
S-2306-A



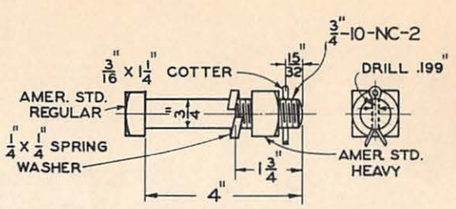
S-2306-7 SWITCH POINT LUG WITHOUT HOLES "A" OR "B"
S-2306-8 " " " WITH " "A"
S-2306-9 " " " " " "B"
S-2306-10 " " " WITH HOLES "A" AND TWO S-2306-14 BOLTS
S-2306-11 " " " " " "A" " " S-2306-15 "
S-2306-12 " " " " " "B" " " S-2306-16 "
S-2306-13 " " " " " "B" " " S-2306-17 "

O.-H. STEEL

U.S.B.S. DWG. B8060-SH-47



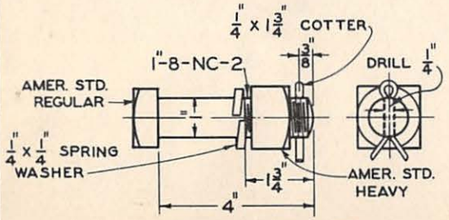
S-2306-16 BOLT COMPLETE
FOR USE ON 110 LB. OPEN-HEARTH SWITCH POINTS
O.-H. STEEL



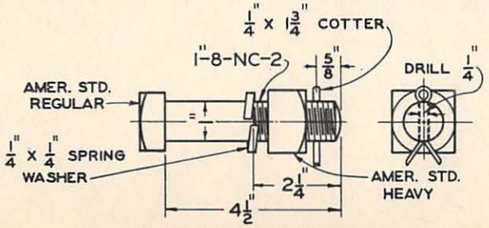
S-2306-17 BOLT COMPLETE
FOR USE ON 110 LB. MANGANESE SWITCH POINTS
O.-H. STEEL

NOTE

SWITCH POINT LUG SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



S-2306-14 BOLT COMPLETE
FOR USE ON 112, 130, AND 131 LB. OPEN-HEARTH SWITCH POINTS
O.-H. STEEL



S-2306-15 BOLT COMPLETE
FOR USE ON 112, 130, AND 131 LB. MANGANESE SWITCH POINTS
O.-H. STEEL

SCALE IN INCHES
0 1 2 3 4 5 6

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C.H.W.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
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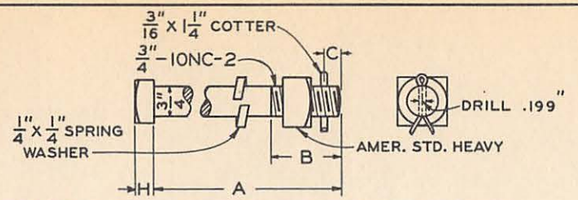
PERE MARQUETTE RAILWAY COMPANY

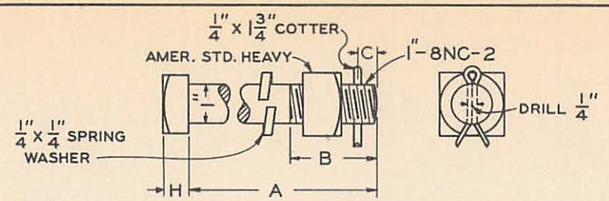
STANDARD SWITCH CIRCUIT CONTROLLER ROD

APPROVED BY OCT 27 1936
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: OCT. 7, 1936
CHIEF ENGINEER

SHEET 2 OF 2
S-2306-A ← B



BOLT COMPLETE FOR 110 LB. R.E. SWITCH POINTS
CARBON OR ALLOY STEEL, HEAT TREATED
SCALE (2)

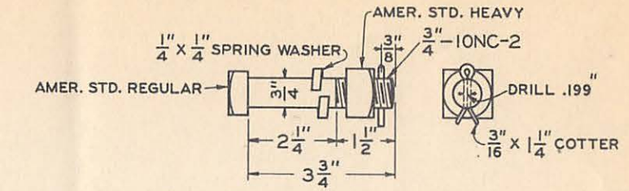


BOLT COMPLETE FOR 112, 130, AND 131 LB. R.E. SWITCH POINTS
CARBON OR ALLOY STEEL, HEAT TREATED
SCALE (2)

REFERENCE	BOLTS FOR STANDARD SWITCH, 110 LB. R.E. RAIL	A	B	C	H
S-2307-5	FOR FASTENING FRONT ROD TO OPEN-HEARTH SWITCH POINT	4"	1 1/2"	19/32"	*
S-2307-6	FOR FASTENING FRONT ROD AND POINT LUG TO OPEN-HEARTH SWITCH POINT	4 1/2"	1 3/4"	11/32"	*
S-2307-7	FOR FASTENING FRONT ROD TO MANGANESE SWITCH POINT	4 1/2"	1 3/4"	23/32"	*
S-2307-8	FOR FASTENING FRONT ROD AND POINT LUG TO MANGANESE SWITCH POINT	5"	1 3/4"	15/32"	*
REFERENCE	BOLTS FOR SPRING SWITCH, 110 LB. R.E. RAIL	A	B	C	H
S-2307-22	FOR FASTENING FRONT ROD TO SAMSON TYPE SWITCH POINT, SEE NOTE 2.	5"	1 3/4"	23/32"	3/8"
S-2307-23	FOR FASTENING FRONT ROD AND POINT LUG TO SAMSON TYPE SWITCH POINT, SEE NOTE 2.	5 1/2"	1 3/4"	15/32"	3/8"

REFERENCE	BOLTS FOR STANDARD SWITCH, 112, 130, AND 131 LB. R.E. RAIL	A	B	C	H
S-2307-9	FOR FASTENING FRONT ROD TO OPEN-HEARTH SWITCH POINT	4 1/2"	2 1/4"	5/8"	*
S-2307-10	FOR FASTENING FRONT ROD AND POINT LUG TO OPEN-HEARTH SWITCH POINT	5"	2 1/4"	3/8"	*
S-2307-11	FOR FASTENING FRONT ROD TO MANGANESE SWITCH POINT	4 1/2"	2 1/4"	3/8"	*
S-2307-12	FOR FASTENING FRONT ROD AND POINT LUG TO MANGANESE SWITCH POINT	5 1/2"	2 1/4"	5/8"	*
REFERENCE	BOLTS FOR SPRING SWITCH, 112, 130, AND 131 LB. R.E. RAIL	A	B	C	H
S-2307-28	FOR FASTENING FRONT ROD TO SAMSON TYPE SWITCH POINT, SEE NOTE 2.	5"	2 1/4"	3/8"	3/8"
S-2307-26	FOR FASTENING FRONT ROD AND POINT LUG TO SAMSON TYPE SWITCH POINT, SEE NOTE 2.	6"	2 1/4"	5/8"	3/8"

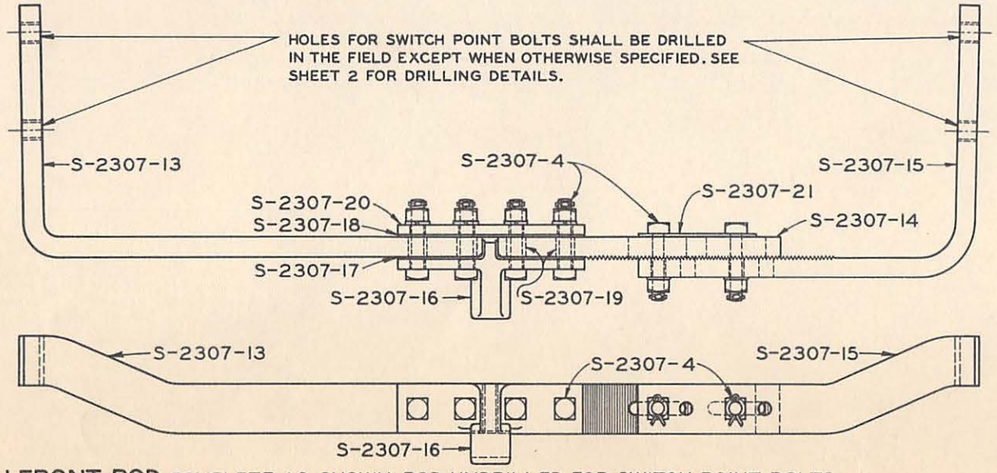
* AMER. STD. REGULAR HEAD



S-2307-4 BOLT COMPLETE
SIX REQUIRED
O.-H. STEEL
SCALE (2)

NOTES

1. FIBRE SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1516, HARD FIBRE.
2. BOLTS FOR USE WITH SPRING SWITCH POINTS OF SAMSON TYPE ARE ALSO APPLICABLE TO ORDINARY OPEN-HEARTH POINTS WITH 1¼ INCH REINFORCING BAR.
3. TENSILE STRENGTH REQUIREMENTS OF BOLTS FOR FASTENING FRONT RODS AND POINT LUGS TO SWITCH POINTS SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-13, SWITCHES, FROGS, CROSSINGS AND GUARD RAILS.



S-2307-1 FRONT ROD COMPLETE AS SHOWN, ROD UNDRILLED FOR SWITCH POINT BOLTS
S-2307-2 " " " " " " DRILLED FOR BOLTS FOR 110 LB. R.E. SWITCH POINTS
S-2307-3 " " " " " " " " " " " 112, 130, AND 131 LB. R.E. SWITCH POINTS
SCALE (1)

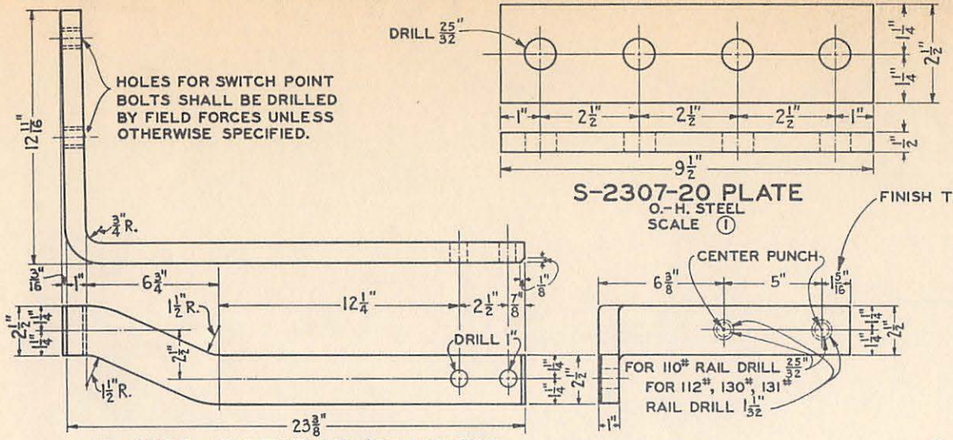
SCALE IN INCHES
(1) 0 1 2 3 4 5 6 7 8 9 10 11 12
(2) 0 1 2 3 4 5 6

APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT AND GENERAL MANAGER	
ERIE RAILROAD COMPANY — VICE PRESIDENT	
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — EXECUTIVE VICE PRESIDENT	
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT	
C. B. P. / C. B. P.	C.D.M. / A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD FRONT ROD
FOR SINGLE SWITCH

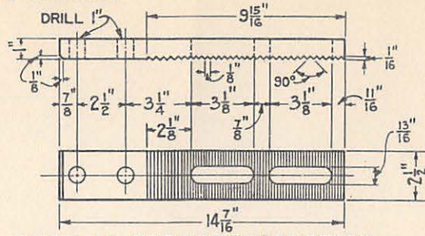
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: DEC. 10, 1937
CHIEF ENGINEER


HOLES FOR SWITCH POINT BOLTS SHALL BE DRILLED BY FIELD FORCES UNLESS OTHERWISE SPECIFIED.
DRILL 25/32"
FINISH TO DIMENSION
CENTER PUNCH
FOR 110# RAIL DRILL 25/32"
FOR 112#, 130#, 131# RAIL DRILL 1 1/32"
DRILL 1"

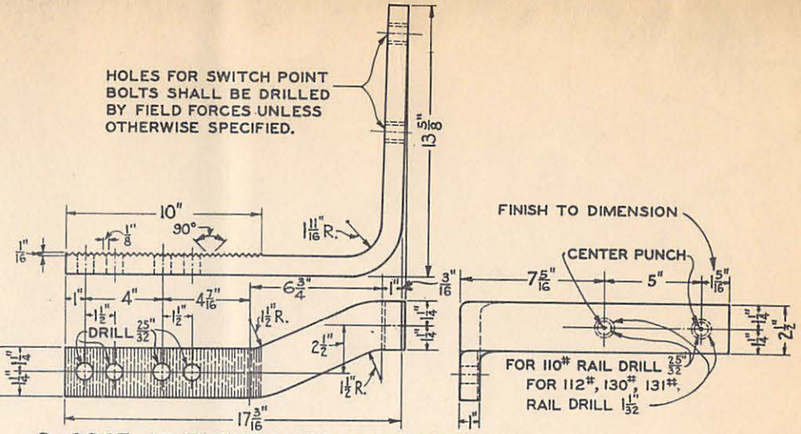
S-2307-13 LEFT HAND LUG END
O.-H. STEEL
SCALE ②

S-2307-20 PLATE
O.-H. STEEL
SCALE ①

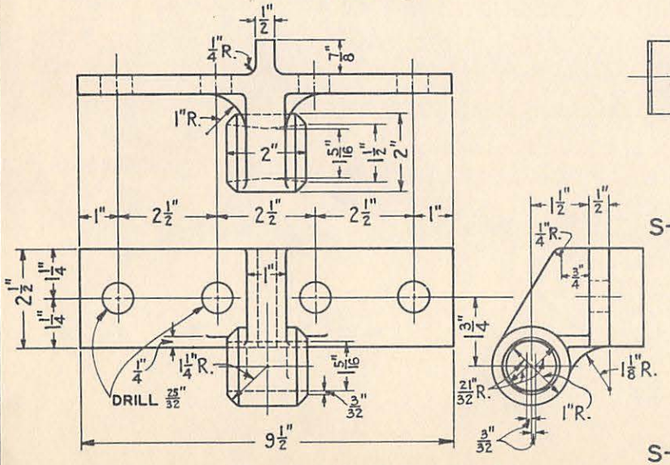
S-2307-21 PLATE WASHER
O.-H. STEEL
SCALE ②



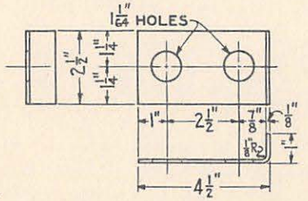
S-2307-14 SERRATED SECTION
O.-H. STEEL
SCALE ②


HOLES FOR SWITCH POINT BOLTS SHALL BE DRILLED BY FIELD FORCES UNLESS OTHERWISE SPECIFIED.
DRILL 25/32"
FINISH TO DIMENSION
CENTER PUNCH
FOR 110# RAIL DRILL 25/32"
FOR 112#, 130#, 131#, RAIL DRILL 1 1/32"

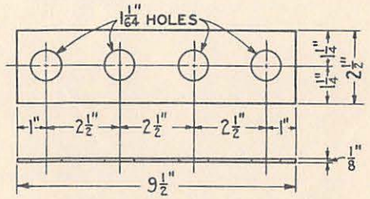
S-2307-15 RIGHT HAND LUG END
SERRATED
O.-H. STEEL
SCALE ②



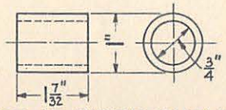
S-2307-16 ADJUSTMENT BRACKET
CAST STEEL OR MALLEABLE IRON
SCALE ①



S-2307-17 INSULATION
TWO REQUIRED
HARD FIBRE
SCALE ③



S-2307-18 INSULATION PLATE
HARD FIBRE
SCALE ③



S-2307-19 FIBRE BUSHING
FOUR REQUIRED
HARD FIBRE
SCALE ④

NOTE

FIBRE SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1516, HARD FIBRE.

SCALE IN INCHES

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
EXECUTIVE VICE PRESIDENT

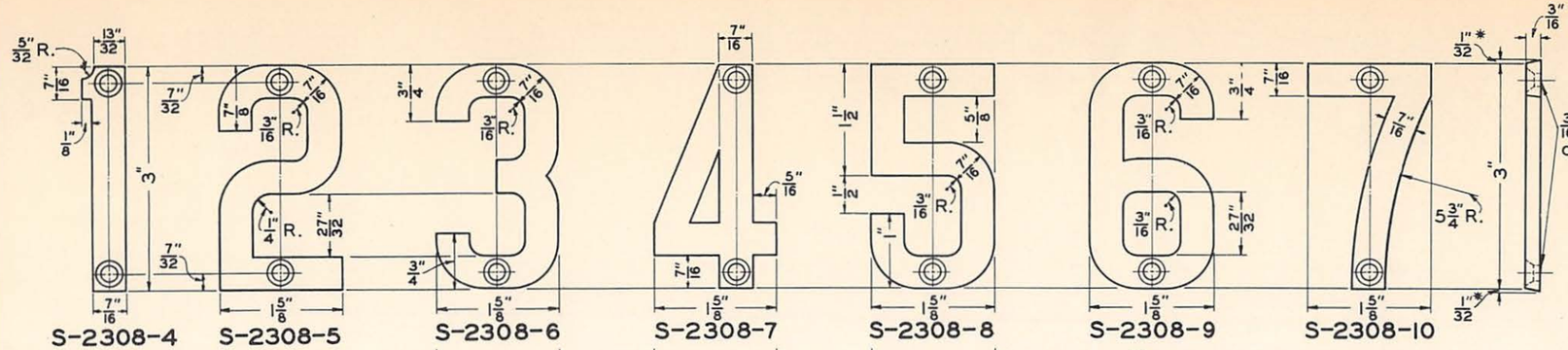
PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

C. B. P.	C. D.M.	A. J. P.
C. B. P.		

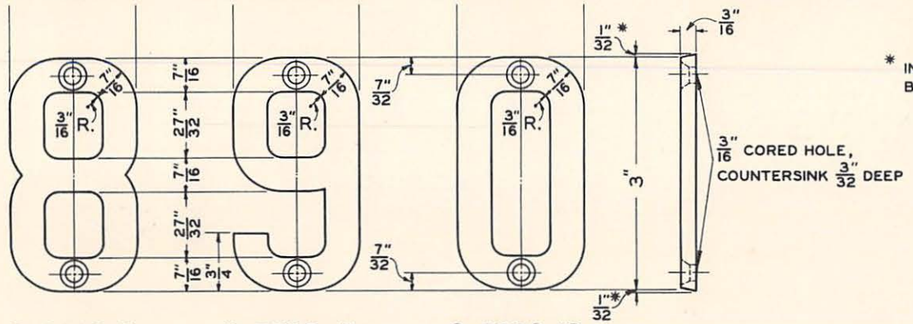
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD
FRONT ROD
FOR SINGLE SWITCH

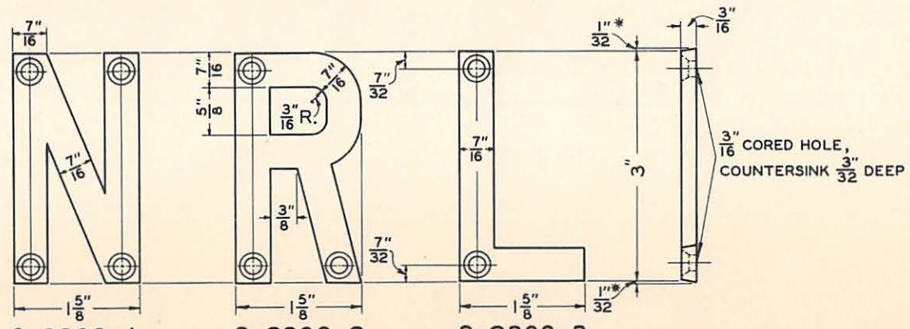
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: DEC. 10, 1937
CHIEF ENGINEER



S-2308-4 S-2308-5 S-2308-6 S-2308-7 S-2308-8 S-2308-9 S-2308-10



S-2308-11 S-2308-12 S-2308-13



S-2308-1 S-2308-2 S-2308-3

* IN PLAN VIEW THIS BEVEL IS NOT SHOWN

NOTES

1. NUMBERS SHALL BE MOUNTED WITH #8–36 X 1/2" FLAT HEAD MACHINE SCREWS OR #8 X 1/2" COUNTERSUNK HEAD RIVETS.
2. LETTERS R AND L SHALL BE MOUNTED WITH SAME FASTENINGS AS NUMBERS.
3. LETTER N SHALL BE MOUNTED WITH #8 X 2 1/2" FLAT HEAD WOOD SCREWS.
4. LETTERS AND NUMBERS SHALL BE MADE OF CAST IRON UNLESS OTHERWISE SPECIFIED.

SCALE IN INCHES

0 1 2 3

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Bro ooke, VICE PRESIDENT		
ERIE RAILROAD COMPANY — R E Woodruff, VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D Bro ooke, VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — J J Bowman, VICE PRESIDENT		
C. B. P.	C. D.M.	A. J. P.
C. B. P.		

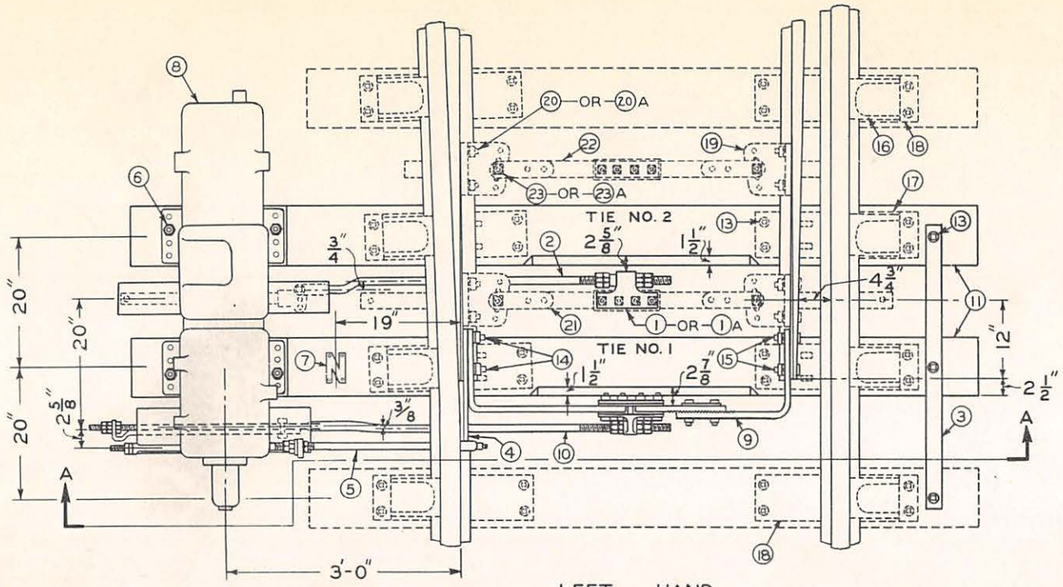
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD FUNCTION NUMBERS AND LETTERS

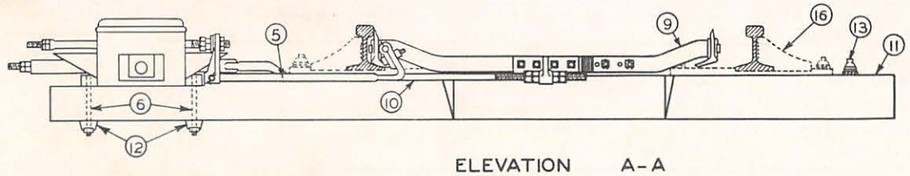
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: E W Kuchel, CHIEF ENGINEER FEB. 20, 1934

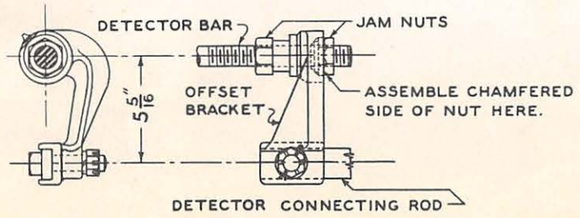
S-2308



LEFT HAND



ELEVATION A-A



"X" SEE NOTE NO. 4

NO SCALE

BILL OF MATERIAL

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(1)	SWITCH ADJUSTMENT BRACKET, OPEN TYPE, COMPLETE WITH SLEEVE AND JAM NUTS	1	S-2301-11
OR (1) A	" " " , ENCLOSED TYPE, " " " " " "	1	———
(2)	OPERATING ROD, COMPLETE WITH PIN AND COTTER	1	S-2309-4
(3)	TIE STRAP 3/4 X 2 1/2" X 3'-7"	1	S-2309-18
(4)	SWITCH POINT LUG, SEE DRILLING TABLE, SHEET 3	1	S-2309
(5)	DETECTOR CONNECTING ROD, COMPLETE WITH CLAMP AND BOLT	1	S-2309-14
(6)	7/8" X 11" MACHINE STUD BOLT WITH HEX. NUT, SQUARE NUT, AND SPRING WASHER	4	S-2309-19
(7)	LETTER PLATE "N" WITH 2 1/2"-#8 FLAT HEAD WOOD SCREWS	1	S-2308-1
(8)	MODEL M-2 ELEC. S. & L. MACH. WITH OFFSET BRACKET AND POINT DETECTOR BAR "X." SPECIFY L.H. OR R.H.	1	———
(9)	FRONT ROD COMPLETE, SEE DETAIL DRAWINGS	1	S-2307-
(10)	LOCK ROD COMPLETE, WITH LOCK PLATE, BOLT, AND NUTS	1	S-2309-3
(11)	NO. 1 AND 2 SAWED, TREATED, TIE 7"X 9"X 10'-9" FOR L.H. LAYOUT	1 SET	S-2309-22
OR (11) A	NO. 1 AND 2 SAWED, TREATED, TIE 7"X 9"X 10'-9" FOR R.H. LAYOUT	1 SET	S-2309-23
(12)	CAST IRON WASHER	4	S-2301-19
(13)	LAG SCREW AND SPRING WASHER	3	R-523
(14)	BOLT, SPECIFY SIZE, SEE DETAIL DRAWINGS, SHEET 1	2	S-2307-
(15)	" " " " " " " "	2	S-2307-

OTHER TRACK MATERIAL WHICH MAY BE REQUIRED

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(13)	LAG SCREW AND SPRING WASHER	32	R-523
(16)	RAIL BRACE (SPECIFY WEIGHT OF RAIL)	8	R-700
(17)	SLIDE PLATE S-1-A	4	SEE R DRAWINGS FOR LAYOUTS
(18)	SLIDE PLATE S-1	4	
(19)	TRANSIT CLIP	4	
(20)	1" X 4 1/2" BOLT WITH NUT, WASHER AND COTTER	8	
OR (20) A	3/4" X 3 3/4" BOLT WITH NUT, WASHER AND COTTER	8	
(21)	NO. 1 HEAD ROD, INSULATED	1	
(22)	NO. 2 ROD, INSULATED	1	
(23)	1 1/8" X 5" BOLT WITH NUT, WASHER AND COTTER	4	
OR (23) A	1" X 4 1/4" BOLT WITH NUT, WASHER AND COTTER	4	

NOTES

1. AFTER STARTING, LAG SCREWS SHALL BE SCREWED DOWN THEIR ENTIRE LENGTH INTO HOLES CONTAINING A SMALL AMOUNT OF CREOSOTE. HOLES SHALL BE BORED WITH 5/8" BIT TO A DEPTH OF APPROXIMATELY 5 3/4".
2. LAYOUT SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. ALL ITEMS IN BILL OF MATERIAL ARE INTERCHANGEABLE FOR EITHER LEFT OR RIGHT HAND LAYOUT EXCEPT ITEMS (11) AND (11) A.
4. WHEN ORDERING DETECTOR CONNECTING ROD FIG. 5 FOR REPLACING FORMER STANDARD RIGID ROD ON EXISTING LAYOUTS, OFFSET BRACKET AND POINT DETECTOR BAR "X" MUST BE ORDERED SEPARATELY.

SCALE IN INCHES
0 6 12 24 36

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
H. Townsend
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
W. D. Barber
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
W. Brooke
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
J. J. Bowman
VICE PRESIDENT

C.H.W. | W.S.E. | C.A.T.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

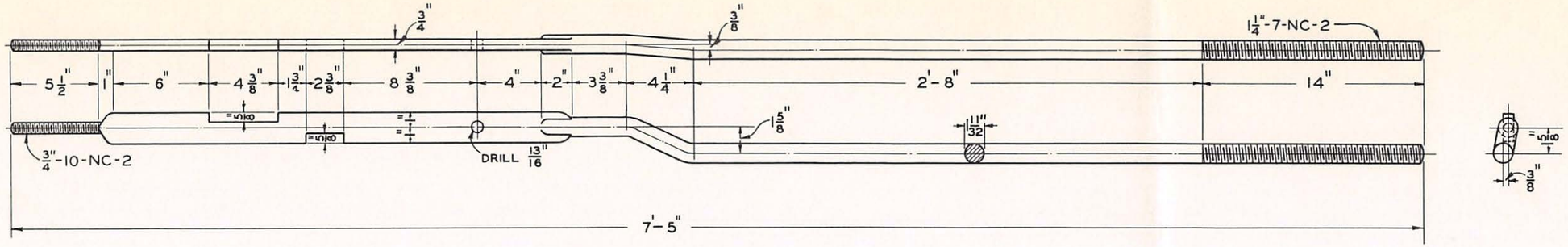
STANDARD

LAYOUT FOR STYLE M-2 ELECTRIC SWITCH MECHANISM

FOR SINGLE SWITCH

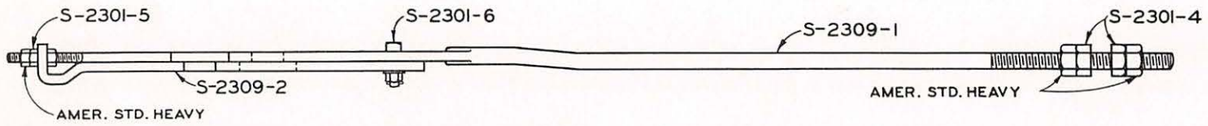
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
A. C. Harvey
CHAIRMAN
NOV. 9, 1939

SHEET 1 OF 4
S-2309-B



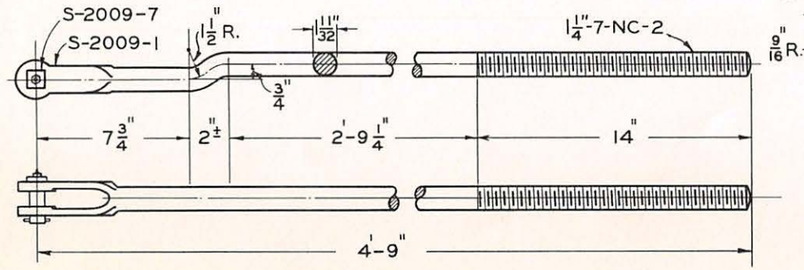
S-2309-1 LOCK ROD ONLY

O.-H. STEEL
SCALE ①



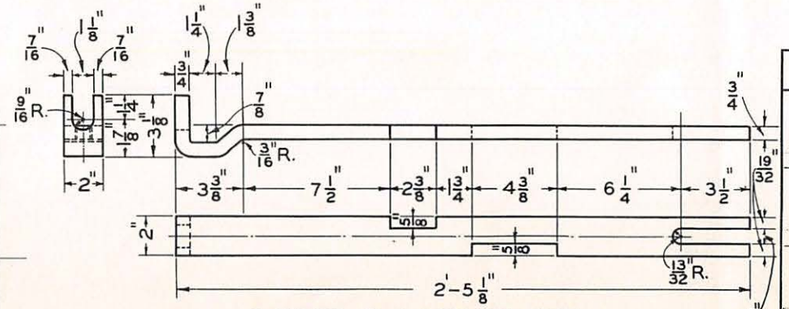
S-2309-3 LOCK ROD COMPLETE AS SHOWN

SCALE ②



S-2309-4 OPERATING ROD COMPLETE AS SHOWN

O.-H. STEEL
SCALE ①



S-2309-2 LOCK PLATE

O.-H. STEEL
SCALE ①

NOTE

ALL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
① 0 2 4 6 8 10 12
② 0 3 6 9 12 15 18

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STANDARD

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FOR SINGLE SWITCH

APPROVED BY
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NOV. 9, 1939

SHEET 2 OF 4
S-2309-B

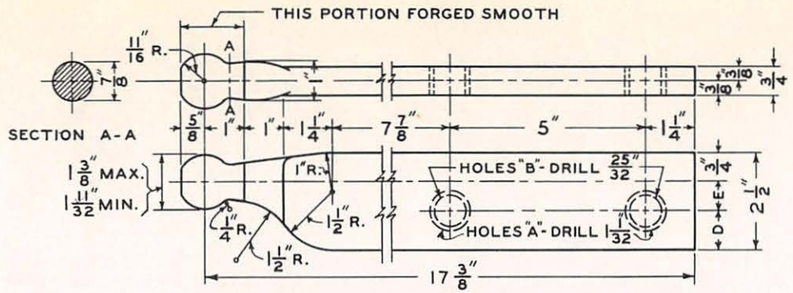
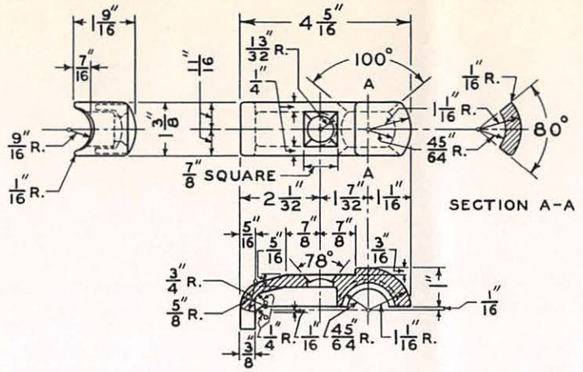


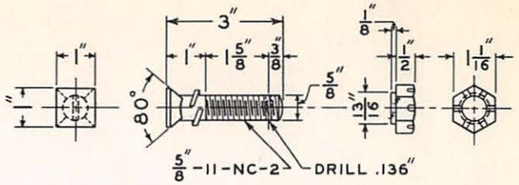
TABLE SHOWING SWITCH POINT LUG DRILLING	D	E
FOR 110 LB. R.E. RAIL, HOLES "B"	1"	3/4"
FOR 112, 130, AND 131 LB. R.E. RAIL, HOLES "A"	1 1/4"	1/2"

S-2309-6 SWITCH POINT LUG WITHOUT HOLES "A" OR "B"
S-2309-7 " " " WITH " "A"
S-2309-8 " " " " " "B"
S-2309-9 " " " WITH HOLES "A" AND TWO S-2307-10 BOLTS
S-2309-10 " " " " " "A" " " S-2307-12 "
S-2309-11 " " " " " "B" " " S-2307-6 "
S-2309-12 " " " " " "B" " " S-2307-8 "

O.-H. STEEL
SCALE (1)

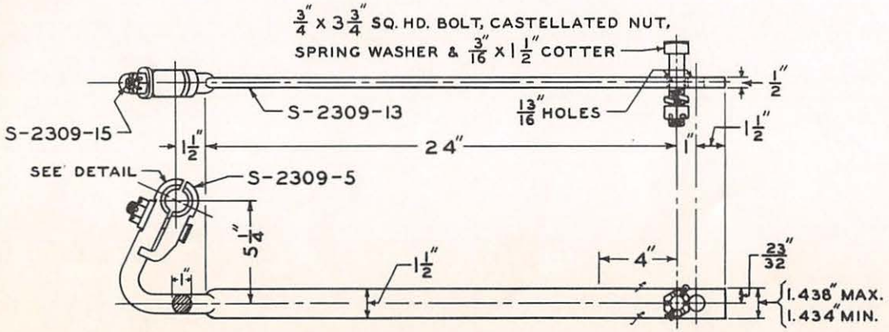


S-2309-5 CLAMP FOR DETECTOR ROD
M. I.
SCALE (1)

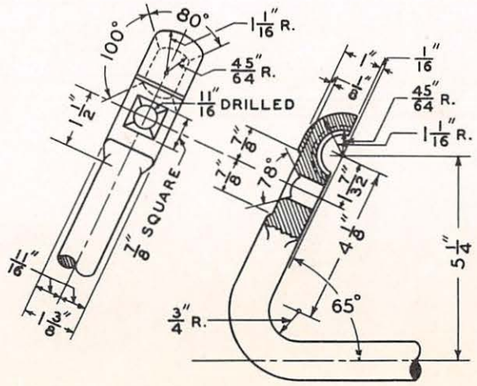


S-2309-15 BOLT COMPLETE WITH NUT, 1/8"X1 1/2" COTTER AND 13/64"X3/8" SPRING WASHER
O.-H. STEEL
SCALE (1)

NOTE
ALL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



S-2309-13 DETECTOR CONNECTING ROD ONLY
S-2309-14 " " " COMPLETE AS SHOWN
O.-H. STEEL
SCALE (2)



DETAIL OF SOCKET
SCALE (1)

SCALE IN INCHES
(1) 0 1 2 3 4 5 6
(2) 0 2 4 6 8 10 12

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CHAIRMAN
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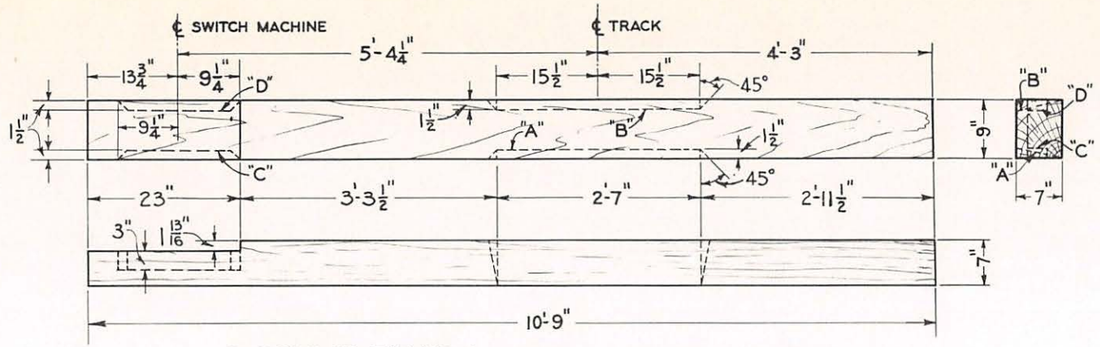
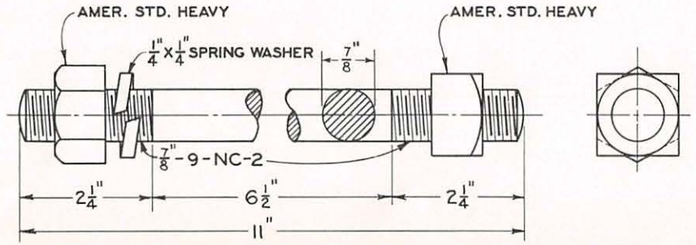
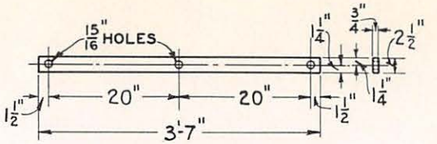


S-2309-16 TIE NO. 1 CHAMFER AT "A" FOR L.H. LAYOUT
S-2309-17 " " " " " "B" " R.H. "
S-2309-20 TIE NO. 2 " " "A", NOTCH AT "C" FOR L.H. LAYOUT
S-2309-21 " " " " " "B", " " "D" " R.H. "
S-2309-22 1 SET OF TIES FOR L.H. LAYOUT CONSISTING OF 1 EACH TIE S-2309-16 AND S-2309-20
S-2309-23 " " " " " R.H. " " " " " S-2309-17 " S-2309-21

SCALE ①



S-2309-19 MACHINE STUD BOLT COMPLETE AS SHOWN
O.-H. STEEL
SCALE ②



S-2309-18 TIE STRAP
O.-H. STEEL
SCALE ①

NOTES

1. TIE STRAP SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. TIES SHALL BE FURNISHED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-2, SWITCH TIES, AND SHALL BE TREATED, AFTER FRAMING, IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-17, PRESERVATIVE TREATMENT OF CROSS TIES OR SWITCH TIES.

SCALE IN INCHES
① 0 6 12 24 36
② 0 1 2 3 4

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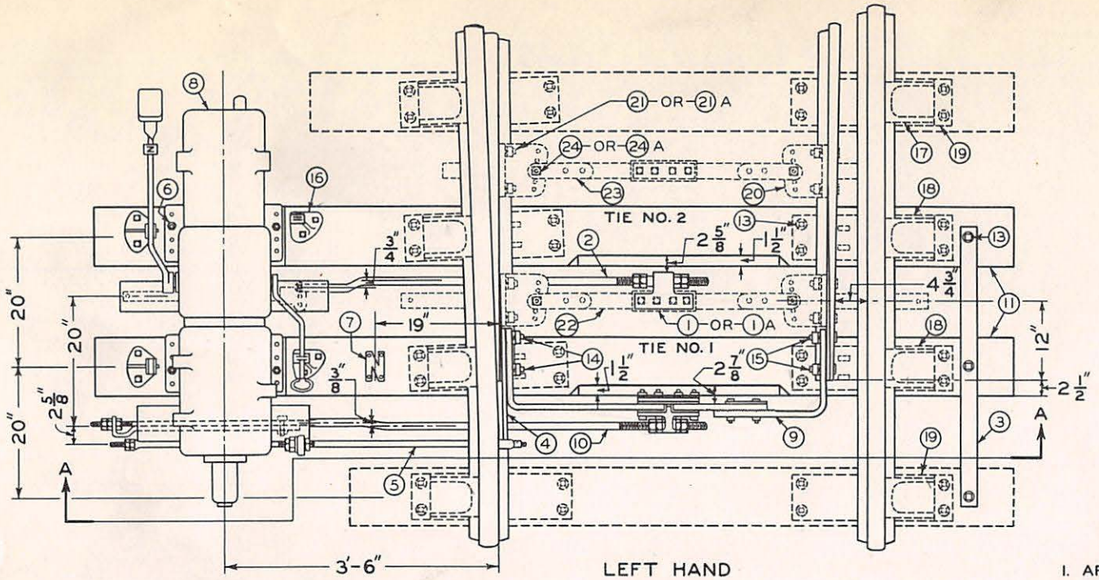
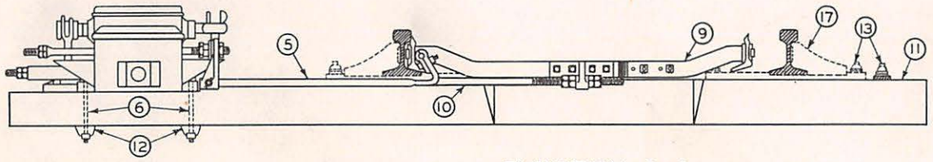
NOV. 9, 1939

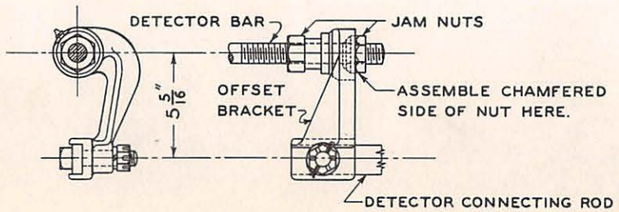
SHEET 4 OF 4
S-2309-B



LEFT HAND



ELEVATION A-A



"X" SEE NOTE NO. 4

NO SCALE

BILL OF MATERIAL

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(1)	SWITCH ADJUSTMENT BRACKET, OPEN TYPE, COMPLETE WITH SLEEVE AND JAM NUTS	1	S-2301-11
OR (1) A	" " " , ENCLOSED TYPE, " " " " " "	1	———
(2)	OPERATING ROD, COMPLETE WITH PIN AND COTTER	1	S-2312-3
(3)	TIE STRAP 3/4" x 2 1/2" x 3'-7"	1	S-2309-18
(4)	SWITCH POINT LUG, SEE DRILLING TABLE, DETAILED DRAWINGS, SHEET 3	1	S-2309-
(5)	DETECTOR CONNECTING ROD, COMPLETE WITH CLAMP AND BOLT	1	S-2312-7
(6)	7/8" X 11" MACHINE STUD BOLT WITH HEX. NUT, SQUARE NUT, AND SPRING WASHER	4	S-2309-19
(7)	LETTER PLATE "N" WITH 2 1/2" - #8 FLAT HEAD WOOD SCREWS	1	S-2308-1
(8)	MODEL M-22 ELEC. S. & L. MACH. WITH OFFSET BRACKET AND POINT DETECTOR BAR "X". SPECIFY L.H. OR R.H.	1	———
(9)	FRONT ROD COMPLETE, SEE DETAIL DRAWINGS	1	S-2307-
(10)	LOCK ROD COMPLETE, WITH LOCK PLATE, BOLT, AND NUTS	1	S-2312-2
(11)	NO. 1 AND 2 SAWED, TREATED, TIE, 7"X 9"X 11'-9" FOR L.H. LAYOUT	1 SET	S-2312-10
OR (11) A	NO. 1 AND 2 SAWED, TREATED, TIE, 7"X 9"X 11'-9" FOR R.H. LAYOUT	1 SET	S-2312-11
(12)	CAST IRON WASHER	4	S-2301-19
(13)	LAG SCREW AND SPRING WASHER	3	R-523
(14)	BOLT, SPECIFY SIZE, SEE DETAILED DRAWINGS, SHEET 1	2	S-2307-
(15)	" " " " " " " "	2	S-2307-
(16)	3/4" X 4 1/2" HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS	8	———

OTHER TRACK MATERIAL WHICH MAY BE REQUIRED

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(13)	LAG SCREW AND SPRING WASHER	32	R-523
(17)	RAIL BRACE (SPECIFY WEIGHT OF RAIL)	8	R-700
(18)	SLIDE PLATE S-1-A	4	SEE R DRAWINGS FOR LAYOUTS
(19)	SLIDE PLATE S-1	4	
(20)	TRANSIT CLIP	4	
(21)	1"X 4 1/2" BOLT WITH NUT, WASHER, AND COTTER	8	
OR (21) A	3/4" X 3 3/4" BOLT WITH NUT, WASHER, AND COTTER	8	
(22)	NO. 1 HEAD ROD, INSULATED	1	
(23)	NO. 2 ROD, INSULATED	1	
(24)	1 1/8" X 5" BOLT WITH NUT, WASHER, AND COTTER	4	
OR (24) A	1"X 4 1/4" BOLT WITH NUT, WASHER, AND COTTER	4	

SCALE IN INCHES
0 6 12 24 36

NOTES

1. AFTER STARTING, LAG SCREWS SHALL BE SCREWED DOWN THEIR ENTIRE LENGTH INTO HOLES CONTAINING A SMALL AMOUNT OF CREOSOTE.
   HOLES SHALL BE BORED AS FOLLOWS:

DIA. OF LAG SCREW	SIZE BIT	APPROX. DEPTH
7/8"	5/8"	5 3/4"
3/4"	9/16"	3"

2. LAYOUT SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. ALL ITEMS IN BILL OF MATERIAL ARE INTERCHANGEABLE FOR EITHER LEFT OR RIGHT HAND LAYOUT EXCEPT ITEMS (11) AND (11) A.
4. WHEN ORDERING DETECTOR CONNECTING ROD FIG. 5 FOR REPLACING FORMER STANDARD RIGID ROD ON EXISTING LAYOUTS, OFFSET BRACKET AND POINT DETECTOR BAR "X" MUST BE ORDERED SEPARATELY.

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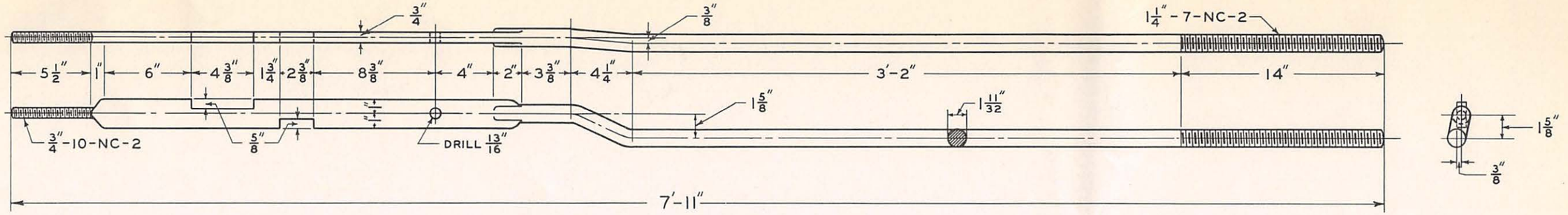
STANDARD

LAYOUT FOR STYLE M-22 ELECTRIC SWITCH MECHANISM

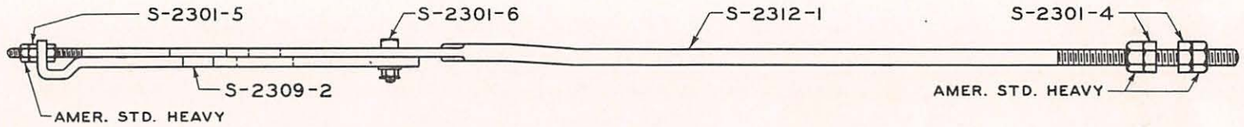
FOR SINGLE SWITCH

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
A.C. Harvey
CHAIRMAN
NOV. 9, 1939



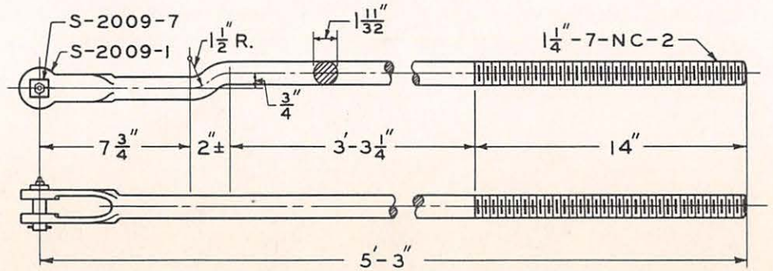
S-2312-1 LOCK ROD ONLY

O.-H. STEEL
SCALE ①



S-2312-2 LOCK ROD COMPLETE AS SHOWN

SCALE ②



S-2312-3 OPERATING ROD COMPLETE AS SHOWN

O.-H. STEEL
SCALE ①

NOTE

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SCALE IN INCHES

① 0 2 4 6 8 10 12

② 0 3 6 9 12 15 18

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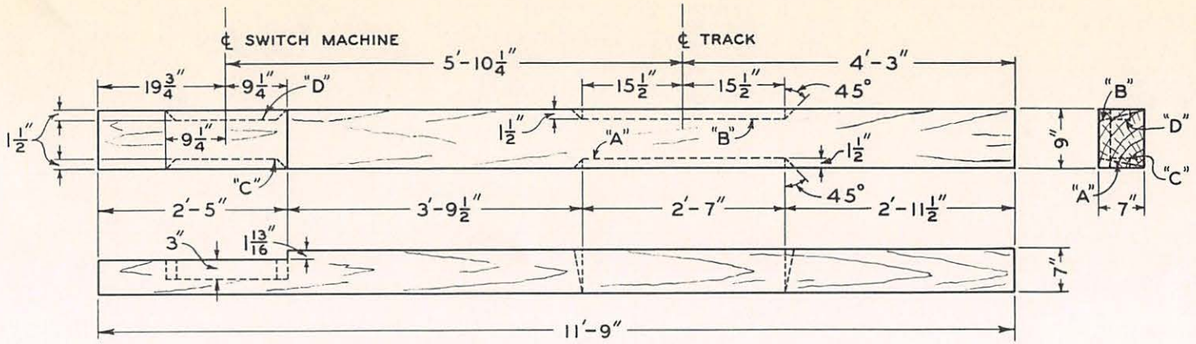
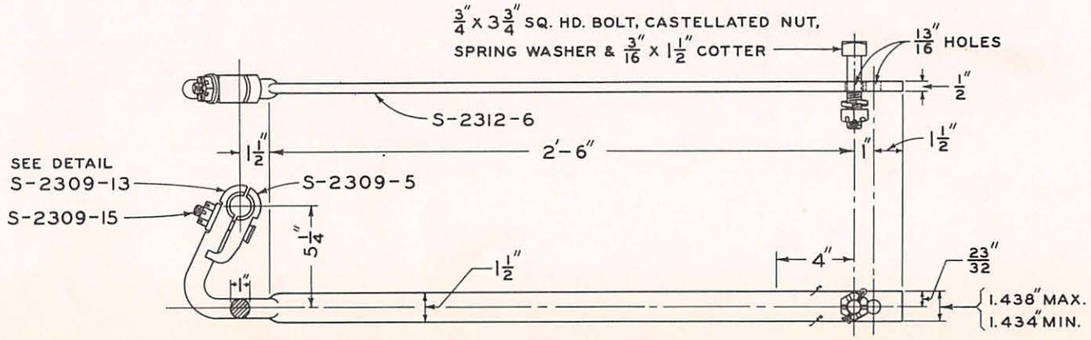
A.G. Harvey
CHAIRMAN
NOV. 9, 1939



S-2312-4 TIE NO. 1 CHAMFER AT "A" FOR L.H. LAYOUT
S-2312-5 " " " " " "B" " R.H. "
S-2312-8 TIE NO. 2 " " "A" NOTCH AT "C" FOR L.H. LAYOUT
S-2312-9 " " " " " "B" " " "D" " R.H. "
S-2312-10 1 SET OF TIES FOR L.H. LAYOUT CONSISTING OF 1 EACH TIE S-2312-4 AND S-2312-8
S-2312-11 " " " " " R.H. " " " " " " " S-2312-5 AND S-2312-9

SCALE ①



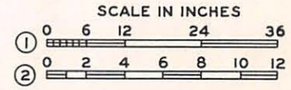
S-2312-6 DETECTOR CONNECTING ROD ONLY
S-2312-7 " " " COMPLETE AS SHOWN

O.-H. STEEL
SCALE ②

NOTE

1. ROD PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. TIES SHALL BE FURNISHED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-2, SWITCH TIES AND SHALL BE TREATED, AFTER FRAMING, IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-17, PRESERVATIVE TREATMENT OF CROSS TIES OR SWITCH TIES.

SCALE IN INCHES



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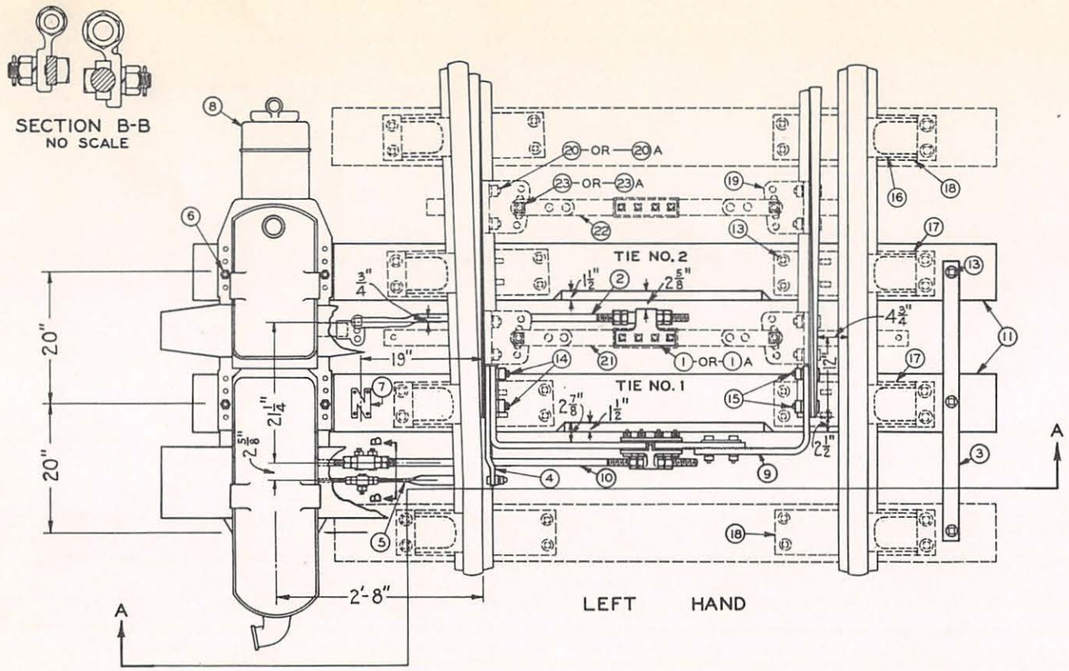

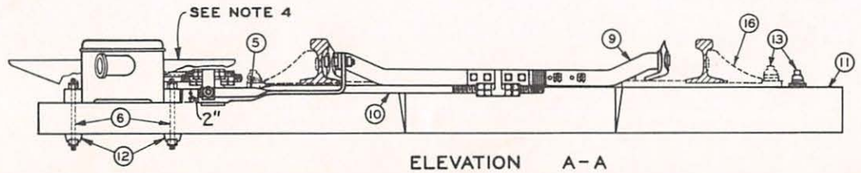

BILL OF MATERIAL

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(1)	SWITCH ADJUSTMENT BRACKET, OPEN TYPE, COMPLETE WITH SLEEVE AND JAM NUTS	1	S-2301-11
OR (1) A	" " " ENCLOSED TYPE, " " " " " "	1	———
(2)	OPERATING ROD, COMPLETE WITH PIN AND COTTER	1	S-2314-3
(3)	TIE STRAP $\frac{3}{4}$" X $2\frac{1}{2}$" X 3'-7"	1	S-2309-18
(4)	SWITCH POINT LUG, SEE DRILLING TABLE, DETAILED DRAWINGS, SHEET 3	1	S-2314
(5)	DETECTOR ROD, COMPLETE WITH BOLTS	1	S-2314-8
(6)	$\frac{3}{4}$" X 11" MACHINE STUD BOLT WITH HEX. NUT, SQUARE NUT, AND SPRING WASHER	4	S-2314-9
(7)	LETTER PLATE "N" WITH $2\frac{1}{2}$"-#8 FLAT HEAD WOOD SCREWS	1	S-2308-1
(8)	MODEL 5A OR 5C SWITCH MACHINE WITH SHORT LOCK ROD LUG. SPECIFY L.H. OR R.H.	1	———
(9)	FRONT ROD COMPLETE, SEE DETAIL DRAWINGS	1	S-2307-
(10)	LOCK CONNECTING ROD, COMPLETE WITH BOLTS AND NUTS	1	S-2314-2
(11)	NO. 1 AND 2 SAWED, TREATED, TIE, 7" X 9" X 10'-3" FOR L. H. LAYOUT	2	S-2314-5
OR (11) A	NO. 1 AND 2 " " " " " " " FOR R. H. LAYOUT	2	S-2314-6
(12)	CAST IRON WASHER	4	S-2301-19
(13)	LAG SCREW AND SPRING WASHER	3	R-523
(14)	BOLT, SPECIFY SIZE, SEE DETAILED DRAWINGS, SHEET 1	2	S-2307-
(15)	" " " " " " " "	2	S-2307-

OTHER TRACK MATERIAL WHICH MAY BE REQUIRED			REFERENCE
FIGURE	DESCRIPTION	REQUIRED	
(13)	LAG SCREW AND SPRING WASHER	32	R-523
(16)	RAIL BRACE (SPECIFY WEIGHT OF RAIL)	8	R-700
(17)	SLIDE PLATE S-1-A	4	SEE R DRAWINGS FOR LAYOUTS
(18)	" " S-1	4	
(19)	TRANSIT CLIP	4	
(20)	1" X $4\frac{1}{2}$" BOLT WITH NUT, WASHER AND COTTER	8	
OR (20) A	$\frac{3}{4}$" X $3\frac{3}{4}$" " " " " " "	8	
(21)	NO. 1 HEAD ROD, INSULATED	1	
(22)	NO. 2 ROD, INSULATED	1	
(23)	$1\frac{1}{8}$" X 5" BOLT WITH NUT, WASHER AND COTTER	4	
OR (23) A	1" X $4\frac{1}{4}$" " " " " " "	4	

SCALE IN INCHES
0 6 12 24 36

NOTES

1. AFTER STARTING, LAG SCREWS SHALL BE SCREWED DOWN THEIR ENTIRE LENGTH INTO HOLES CONTAINING A SMALL AMOUNT OF CREOSOTE. HOLES SHALL BE BORED WITH $\frac{5}{8}$" BIT TO A DEPTH OF APPROXIMATELY $5\frac{1}{4}$".
2. LAYOUT SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. ALL ITEMS IN BILL OF MATERIAL ARE INTERCHANGEABLE FOR EITHER LEFT OR RIGHT HAND LAYOUT EXCEPT ITEMS (11) AND (11)A.
4. ONLY PORTION OF GUARDS SHOWN IN ORDER TO MORE CLEARLY SHOW ROD CONNECTIONS AT MACHINE.

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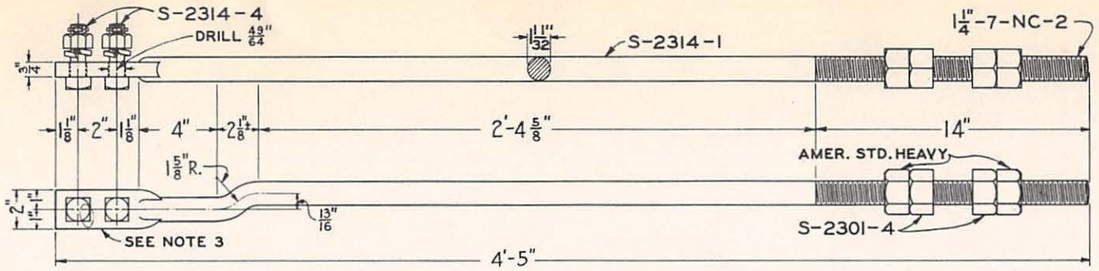
STANDARD

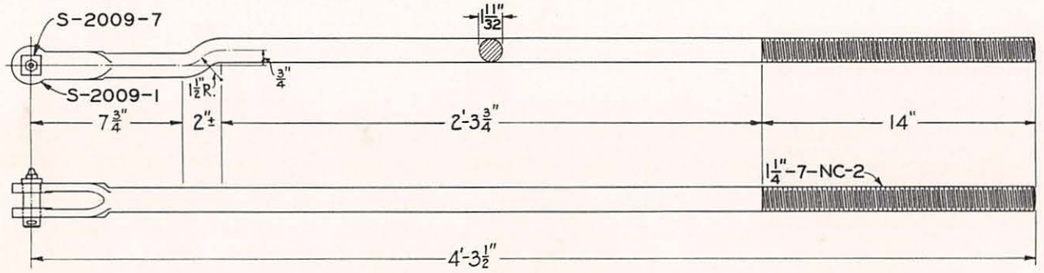
LAYOUT FOR MODEL 5A OR 5C ELECTRIC SWITCH MECHANISM

FOR SINGLE SWITCH

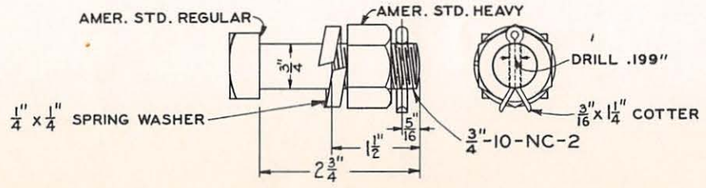
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
A. O. Harvey
CHAIRMAN
NOV. 9, 1939



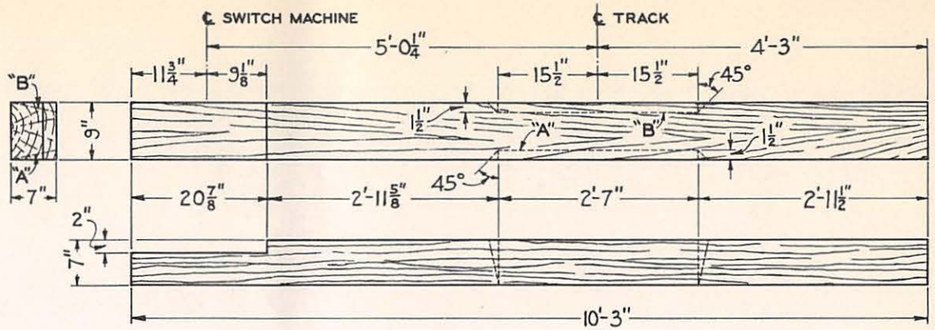
S-2314-1 LOCK CONNECTING ROD ONLY
S-2314-2 LOCK CONNECTING ROD COMPLETE AS SHOWN
O.-H. STEEL
SCALE (1)



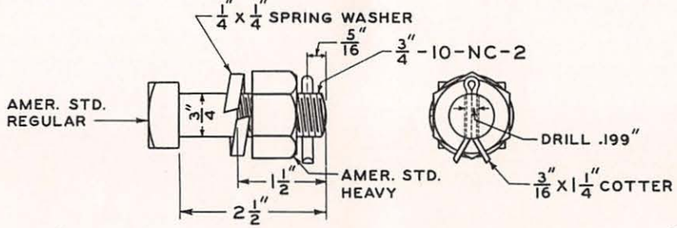
S-2314-3 OPERATING ROD COMPLETE AS SHOWN
O.-H. STEEL
SCALE (1)



S-2314-4 BOLT COMPLETE
O.-H. STEEL
SCALE (2)



S-2314-5 TIE CHAMFER AT "A" FOR L. H. LAYOUT
S-2314-6 TIE " " "B" " R. H. "
SCALE (3)



S-2314-10 BOLT COMPLETE
O.-H. STEEL
SCALE (2)

SCALE IN INCHES
(1) 0 2 4 6 8 10 12
(2) 0 1 2 3 4
(3) 0 6 12 24 36

NOTES

1. RODS, EXCEPT THREADED PORTIONS, SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. TIES SHALL BE FURNISHED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-2, SWITCH TIES, AND SHALL BE TREATED, AFTER FRAMING, IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-17, PRESERVATIVE TREATMENT OF CROSS TIES OR SWITCH TIES.
3. FOR LOCK PLATES SEE MANUFACTURER'S CATALOG.

APPROVED FOR USE

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STANDARD

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FOR SINGLE SWITCH

APPROVED BY
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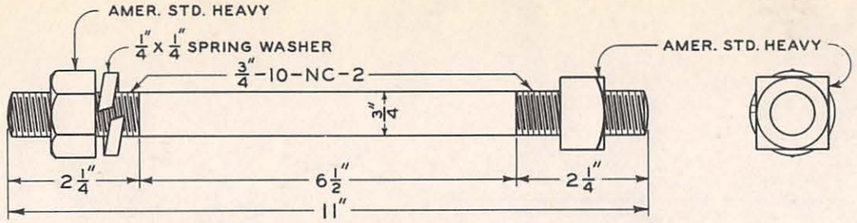
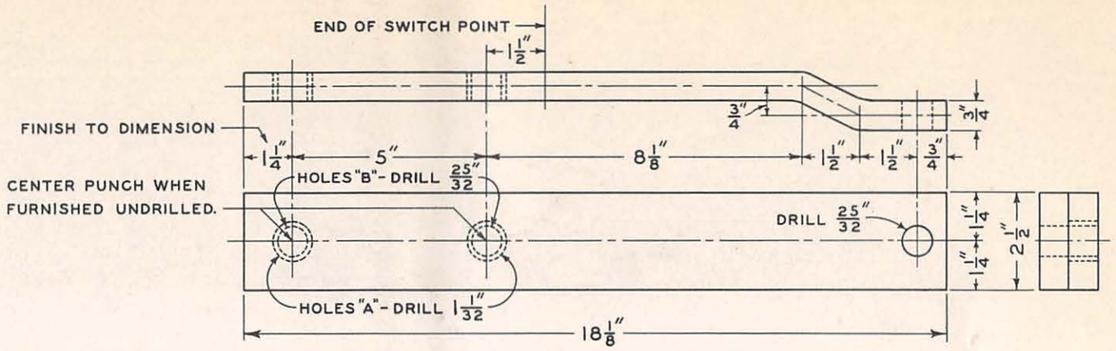
A C Harvey
CHAIRMAN
NOV. 9, 1939

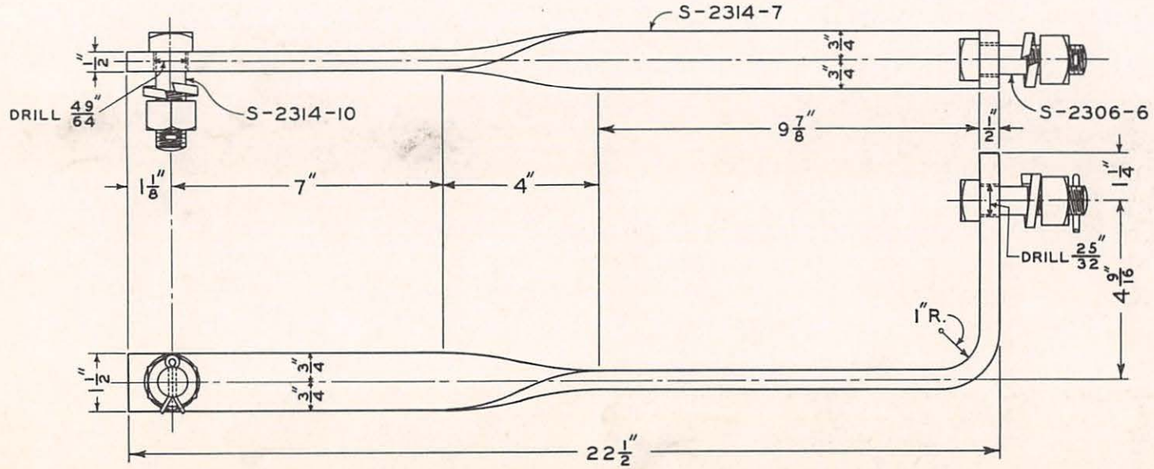


S-2314-9 MACHINE STUD BOLT COMPLETE AS SHOWN
O.-H. STEEL
SCALE ①



S-2314-11 SWITCH POINT LUG WITHOUT HOLES "A" OR "B"
S-2314-12 " " " WITH " "A"
S-2314-13 " " " " " "B"
S-2314-14 " " " WITH HOLES "A" AND TWO S-2307-10 BOLTS
S-2314-15 " " " " " "A" " " S-2307-12 "
S-2314-16 " " " " " "B" " " S-2307-6 "
S-2314-17 " " " " " "B" " " S-2307-8 "

O.-H. STEEL
SCALE ②



S-2314-7 DETECTOR ROD ONLY
S-2314-8 " " COMPLETE AS SHOWN
O.-H. STEEL
SCALE ②

NOTE
ROD SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
① 0 1 2 3 4
② 0 1 2 3 4 5 6

APPROVED FOR USE

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VICE PRESIDENT AND GENERAL MANAGER

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STANDARD

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FOR SINGLE SWITCH

APPROVED BY
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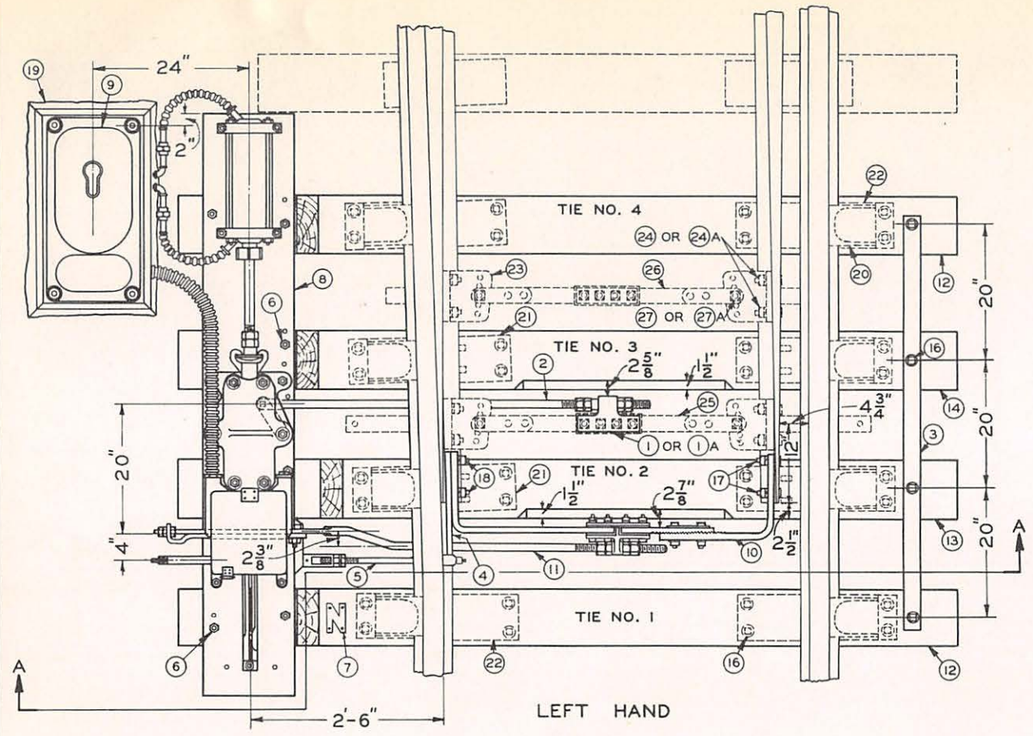
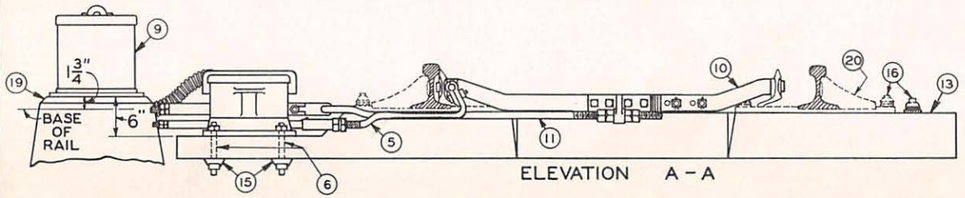
A.C. Harvey
CHAIRMAN
NOV. 9, 1939





BILL OF MATERIAL

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(1)	SWITCH ADJUSTMENT BRACKET, OPEN TYPE, COMPLETE WITH SLEEVE AND JAM NUTS	1	S-2301-11
OR (1)A	" " " ENCLOSED TYPE, " " " " " "	1	———
(2)	OPERATING ROD, COMPLETE WITH PIN AND COTTER	1	S-2319-1
(3)	TIE STRAP ¾"x 2½"x 5'-3"	1	S-2319-9
(4)	SWITCH POINT LUG, SEE DRILLING TABLE, SHEET 2	1	S-2319-
(5)	DETECTOR CONNECTING ROD, COMPLETE WITH JAM NUT AND SPRING WASHER	1	S-2319-23
(6)	¾"x 8" MACHINE STUD BOLT WITH HEX. NUT, SQ. NUT, AND SPRING WASHER	8	S-2319-10
(7)	LETTER PLATE "N" WITH 2½"-#8 FLAT HEAD WOOD SCREWS	1	S-2308-1
(8)	MODEL "A-5" ELECTROPNEUMATIC SWITCH AND LOCK MACHINE WITH 5" DIA. CYLINDER COMPLETE WITH FLEXIBLE CONDUIT. SPECIFY R.H. OR L.H.	1	———
(9)	STYLE CP ELECTROPNEUMATIC SWITCH VALVE WITH AIR HOSE AND FITTINGS	1	———
(10)	FRONT ROD COMPLETE, SEE DETAIL DRAWINGS	1	S-2307-
(11)	L.H. LOCK ROD COMPLETE WITH LOCK PLATE, BOLT, AND NUTS	1	S-2319-15
OR (11)A	R.H. " " " " " " " "	1	S-2319-16
(12)	NO. 1 AND 4 SAWED TREATED TIE 7"x 9"x 10'-0"	2	S-2319-19
(13)	NO. 2 SAWED TREATED TIE 7"x 9"x 10'-0" FOR L.H. LAYOUT	1	S-2319-20
OR (13)A	NO. 2 " " " " " " R.H. "	1	S-2319-21
(14)	NO. 3 " " " " " " " L.H. "	1	S-2319-17
OR (14)A	NO. 3 " " " " " " " R.H. "	1	S-2319-18
(15)	CAST IRON WASHER	8	S-2301-19
(16)	LAG SCREW AND SPRING WASHER	4	R-523
(17)	BOLT, SPECIFY SIZE, SEE DETAILED DRAWINGS, SHEET 1	2	S-2307-
(18)	" " " " " " " "	2	S-2307-
(19)	FOUNDATION FOR E.P. VALVE, LEFT HAND	1	S-2323-1
OR (19)A	" " " " RIGHT HAND	1	S-2323-2

NOTES

1. AFTER STARTING, LAG SCREWS SHALL BE SCREWED DOWN THEIR ENTIRE LENGTH INTO HOLES CONTAINING A SMALL AMOUNT OF CREOSOTE. HOLES SHALL BE BORED WITH ⅝" BIT TO A DEPTH OF APPROXIMATELY 5¾".
2. LAYOUT SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. ALL ITEMS IN BILL OF MATERIAL ARE INTERCHANGEABLE FOR EITHER LEFT OR RIGHT HAND LAYOUT EXCEPT ITEMS (11), (11)A, (13), (13)A, (14), (14)A, (19), AND (19)A.

SCALE IN INCHES
0 6 12 24 36

OTHER TRACK MATERIAL WHICH MAY BE REQUIRED

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(16)	LAG SCREW AND SPRING WASHER	32	R-523
(20)	RAIL BRACE (SPECIFY WEIGHT OF RAIL)	8	R-700
(21)	SLIDE PLATE S-1-A	4	SEE R DRAWINGS FOR LAYOUTS
(22)	" " S-1	4	
(23)	TRANSIT CLIP	4	
(24)	1" x 4½" BOLT WITH NUT, WASHER, AND COTTER	8	

OTHER TRACK MATERIAL WHICH MAY BE REQUIRED

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
OR (24)A	¾" x 3¾" BOLT WITH NUT, WASHER, AND COTTER	8	SEE R DRAWINGS FOR LAYOUTS
(25)	NO. 1 HEAD ROD, INSULATED	1	
(26)	NO. 2 ROD, INSULATED	1	
(27)	1⅛" x 5" BOLT WITH NUT, WASHER, AND COTTER	4	
OR (27)A	1" x 4¼" " " " " " "	4	

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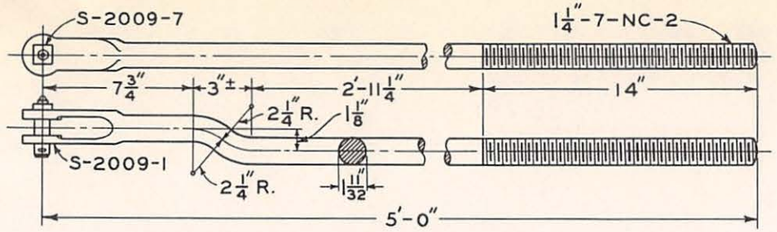
STANDARD LAYOUT FOR STYLE A-5 ELECTRO-PNEUMATIC SWITCH MECHANISM

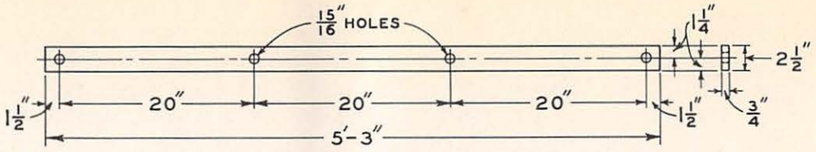
FOR SINGLE SWITCH

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
A.C. Harvey
CHAIRMAN
NOV. 9, 1939

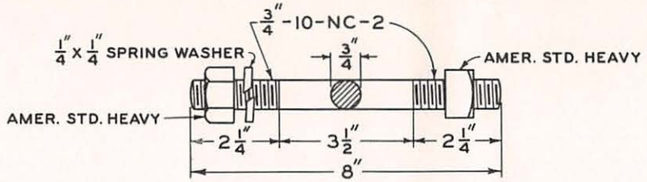
SHEET 1 OF 4
S-2319-B



S-2319-1 OPERATING ROD COMPLETE AS SHOWN
O.-H. STEEL
SCALE ②



S-2319-9 TIE STRAP
O.-H. STEEL
SCALE ③



S-2319-10 MACHINE STUD BOLT COMPLETE AS SHOWN
O.-H. STEEL
SCALE ①

NOTE
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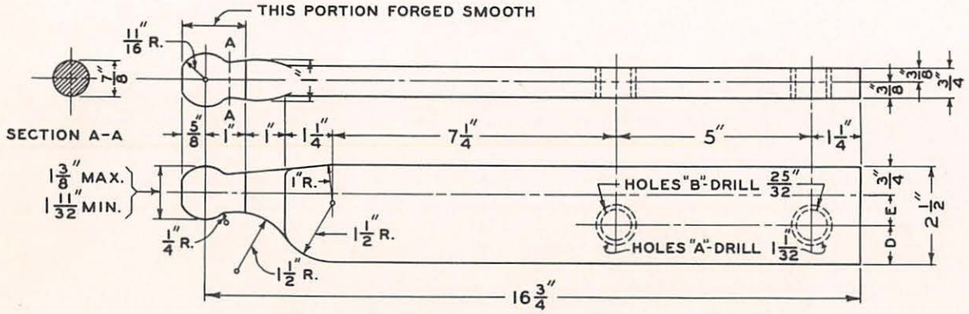

TABLE SHOWING SWITCH POINT LUG DRILLING	D	E
FOR 110 LB. R.E. RAIL, HOLES "B"	1"	¾"
FOR 112, 130, AND 131 LB. R.E. RAIL, HOLES "A"	1¼"	½"

S-2319-2 SWITCH POINT LUG WITHOUT HOLES "A" OR "B"
S-2319-3 " " " WITH " "A"
S-2319-4 " " " " " "B"
S-2319-5 " " " WITH HOLES "A" AND TWO S-2307-10 BOLTS
S-2319-6 " " " " " "A" " " S-2307-12 "
S-2319-7 " " " " " "B" " " S-2307-6 "
S-2319-8 " " " " " "B" " " S-2307-8 "

O.-H. STEEL
SCALE ①

SCALE IN INCHES
① 0 1 2 3 4 5 6
② 0 2 4 6 8 10 12
③ 0 3 6 12 18 24

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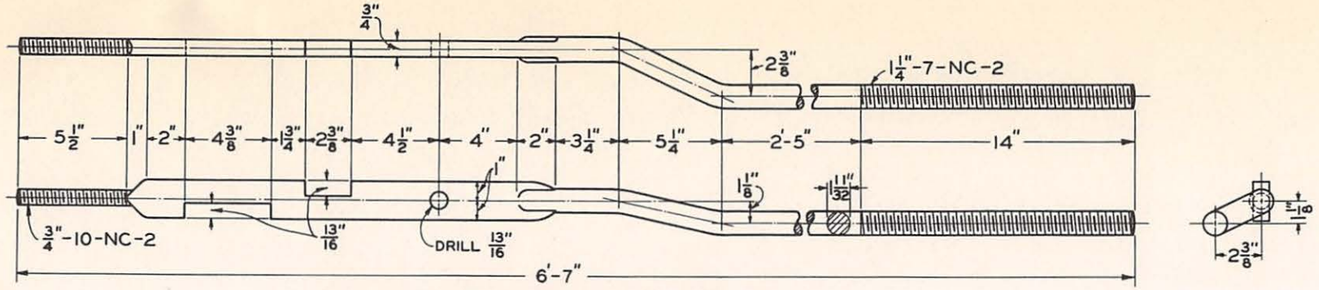
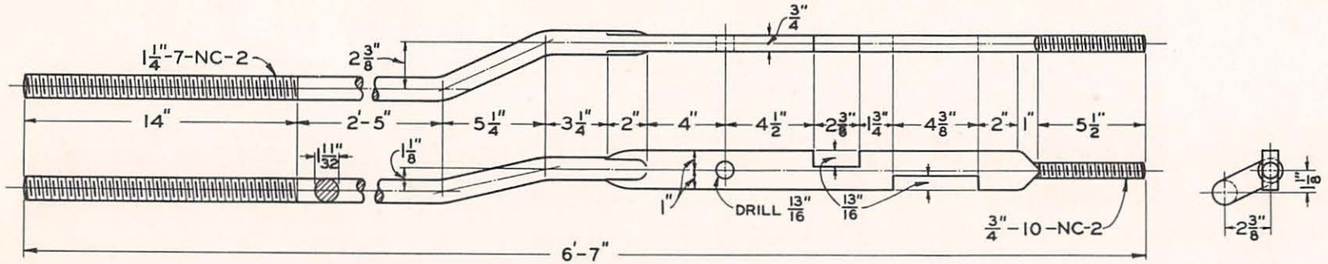
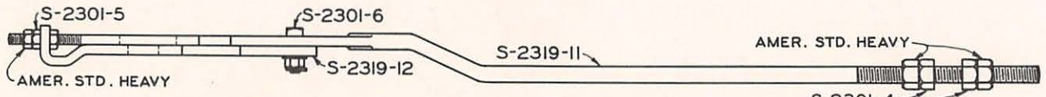


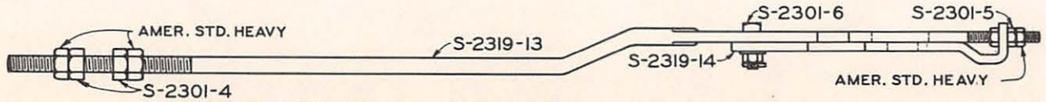
S-2319-11 LEFT HAND LOCK ROD ONLY
O.-H. STEEL
SCALE (1)



S-2319-13 RIGHT HAND LOCK ROD ONLY
O.-H. STEEL
SCALE (1)



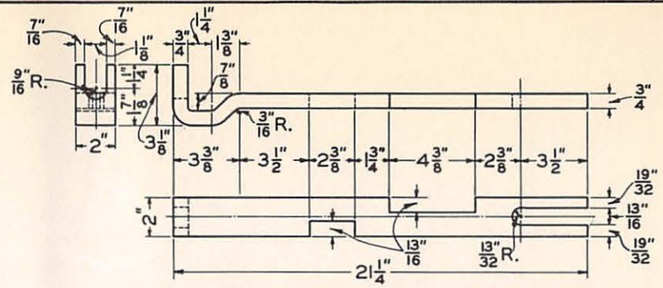
S-2319-15 LEFT HAND LOCK ROD COMPLETE AS SHOWN
SCALE (2)



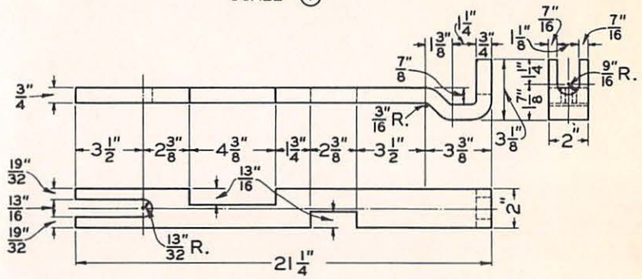
S-2319-16 RIGHT HAND LOCK ROD COMPLETE AS SHOWN
SCALE (2)

NOTE

ALL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.



S-2319-12 LEFT HAND LOCK PLATE
O.-H. STEEL
SCALE (1)



S-2319-14 RIGHT HAND LOCK PLATE
O.-H. STEEL
SCALE (1)

SCALE IN INCHES
(1) 0 3 6 9 12
(2) 0 3 6 9 12 15 18

APPROVED FOR USE

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THE CHESAPEAKE AND OHIO RAILWAY COMPANY
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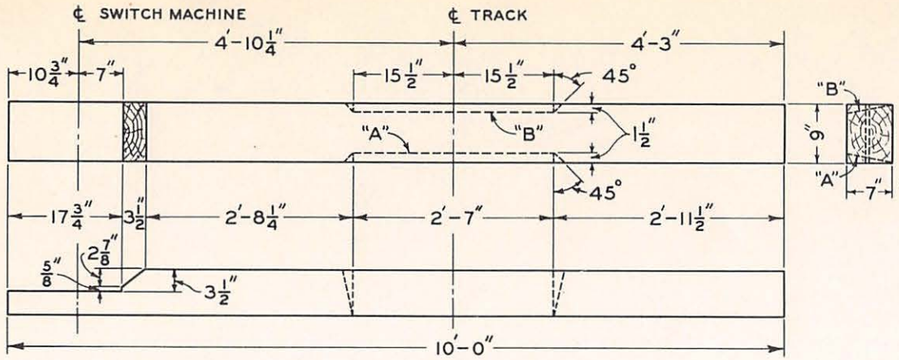
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD LAYOUT FOR STYLE A-5 ELECTRO-PNEUMATIC SWITCH MECHANISM

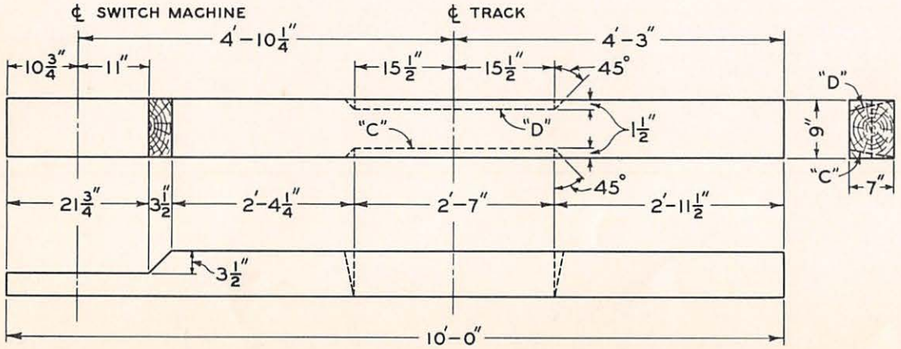
FOR SINGLE SWITCH

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
A. C. Stamy
CHAIRMAN
NOV. 9, 1939

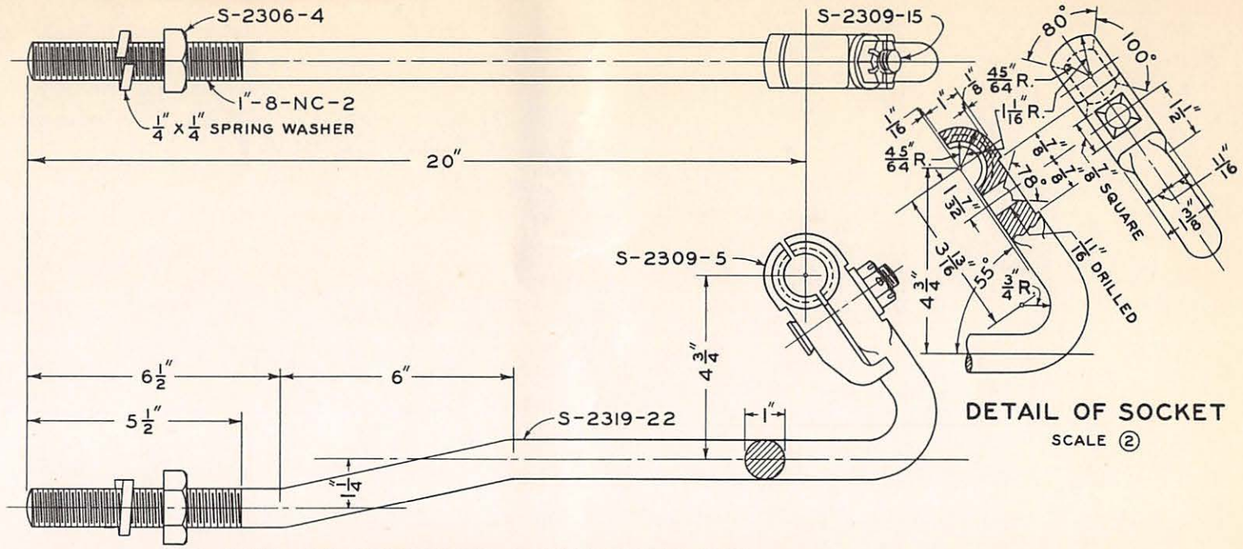
SHEET 3 OF 4
S-2319-B



S-2319-17 TIE CHAMFER AT "A" FOR L.H. LAYOUT
S-2319-18 " " " "B" " R.H. "
S-2319-19 " WITHOUT CHAMFER
SCALE ①



S-2319-20 TIE CHAMFER AT "C" FOR L.H. LAYOUT
S-2319-21 " " " "D" " R.H. "
SCALE ①



S-2319-22 DETECTOR CONNECTING ROD ONLY
S-2319-23 " " " COMPLETE AS SHOWN
O.-H. STEEL
SCALE ②

SCALE IN INCHES
① 0 6 12 24 36
② 0 1 2 3 4 5 6

NOTES

1. ALL METAL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. TIES SHALL BE FURNISHED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-2, SWITCH TIES, AND SHALL BE TREATED, AFTER FRAMING, IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-17, PRESERVATIVE TREATMENT OF CROSS TIES OR SWITCH TIES.

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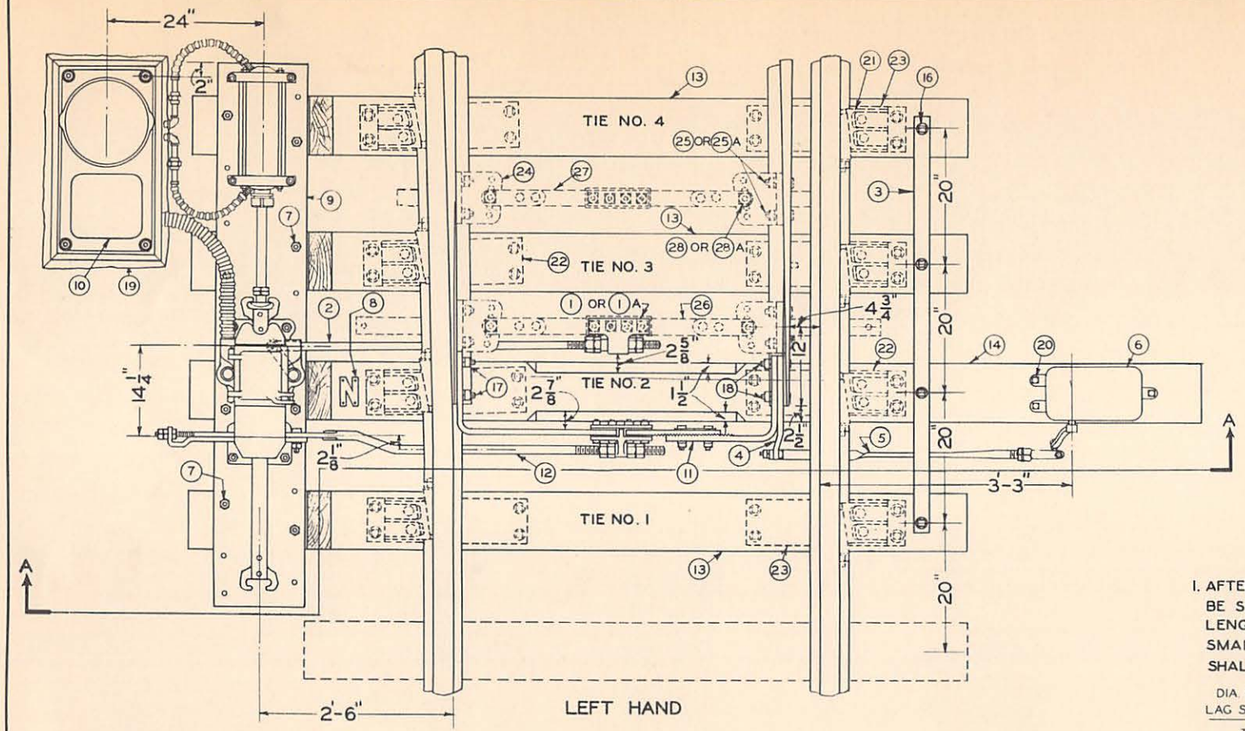
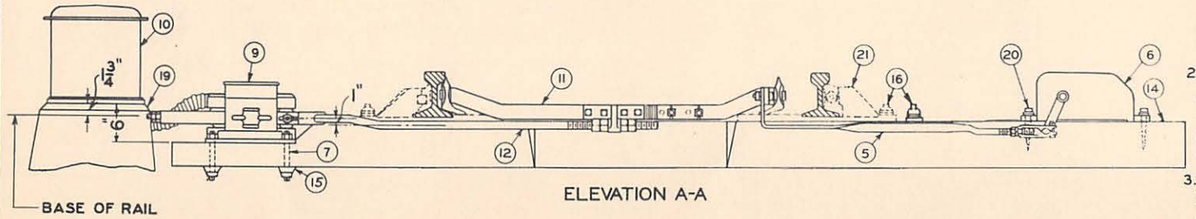
STANDARD LAYOUT FOR STYLE A-5 ELECTRO-PNEUMATIC SWITCH MECHANISM

FOR SINGLE SWITCH

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
A. C. Harvey
CHAIRMAN
NOV. 9, 1939





ELEVATION A-A

BILL OF MATERIAL

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(1)	SWITCH ADJUSTMENT BRACKET, OPEN TYPE, COMPLETE WITH SLEEVE AND JAM NUTS	1	S-2301-11
OR (1)A	" " " ENCLOSED TYPE " " " " " "	1	———
(2)	OPERATING ROD COMPLETE WITH PIN AND COTTER	1	S-2319-1
(3)	TIE STRAP ¾" X 2½" X 5'-3"	1	S-2319-9
(4)	SWITCH POINT LUG, SEE DRILLING TABLE, SHEET 2	1	S-2306-
(5)	SWITCH CIRCUIT CONTROLLER ROD COMPLETE WITH SCREW JAW AND BOLTS	1	S-2306-2
(6)	SWITCH CIRCUIT CONTROLLER	1	———
(7)	¾" X 8" MACHINE STUD BOLT WITH HEX. NUT, SQ. NUT, AND SPRING WASHER	8	S-2319-10
(8)	LETTER PLATE "N" WITH 2½"-#8 FLAT HEAD WOOD SCREWS	1	S-2308-1
(9)	MODEL "A-1" ELECTROPNEUMATIC SWITCH AND LOCK MACHINE COMPLETE WITH FLEXIBLE CONDUIT. SPECIFY L.H. OR R.H.	1	———
(10)	STYLE C ELECTROPNEUMATIC SWITCH VALVE WITH AIR HOSE AND FITTINGS.	1	———
(11)	FRONT ROD COMPLETE, SEE DETAILED DRAWINGS	1	S-2307-
(12)	LOCK ROD COMPLETE WITH LOCK PLATE, BOLT, AND NUTS. SPECIFY L.H. OR R.H.	1	———
(13)	NO. 1, 3, AND 4 SAWED TREATED TIE 7" X 9" X 10'-0"	3	S-2319-19
(14)	NO 2 SAWED TREATED TIE 7" X 9" X 13'-0"	1	S-2323-5
(15)	CAST IRON WASHER	8	S-2301-19
(16)	LAG SCREW AND SPRING WASHER	4	R-523
(17)	BOLT, SPECIFY SIZE, SEE DETAILED DRAWINGS, SHEET 1	2	S-2307-
(18)	" " " " " " " "	2	S-2307-
(19)	FOUNDATION FOR E.P. VALVE, LEFT HAND	1	S-2323-1
OR (19)A	" " " " RIGHT HAND	1	S-2323-2
(20)	¾" X 6" HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS, WITH SPRING WASHER (R-523) AND FLAT WASHER	3	———

NOTES

1. AFTER STARTING LAG SCREWS SHALL BE SCREWED DOWN THEIR ENTIRE LENGTH INTO HOLES CONTAINING A SMALL AMOUNT OF CREOSOTE. HOLES SHALL BE BORED AS FOLLOWS:

DIA OF LAG SCREW	SIZE BIT	APPROX. DEPTH
⅞"	⅝"	5¾"
¾"	9/16"	3"

2. LAYOUT SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
3. ALL ITEMS IN BILL OF MATERIAL ARE INTERCHANGEABLE FOR EITHER RIGHT OR LEFT HAND LAYOUT EXCEPT ITEMS (12), (19), AND (19)A.

SCALE IN INCHES
0 6 12 24 36

OTHER TRACK MATERIAL WHICH MAY BE REQUIRED

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(16)	LAG SCREW AND SPRING WASHER	32	R-523
(21)	RAIL BRACE (SPECIFY WEIGHT OF RAIL)	8	R-700
(22)	SLIDE PLATE S-1-A	4	SEE R DRAWINGS FOR LAYOUTS
(23)	" " S-1	4	
(24)	TRANSIT CLIP	4	
(25)	1" X 4½" BOLT WITH NUT, WASHER, AND COTTER	8	

OTHER TRACK MATERIAL WHICH MAY BE REQUIRED

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
OR (25)A	¾" X 3¾" BOLT WITH NUT, WASHER, AND COTTER	8	SEE R DRAWINGS FOR LAYOUTS
(26)	NO. 1 HEAD ROD, INSULATED	1	
(27)	NO. 2 ROD, INSULATED	1	
(28)	1⅛" X 5" BOLT WITH NUT, WASHER, AND COTTER	4	
OR (28)A	1" X 4¼" " " " " " "	4	

APPROVED FOR USE

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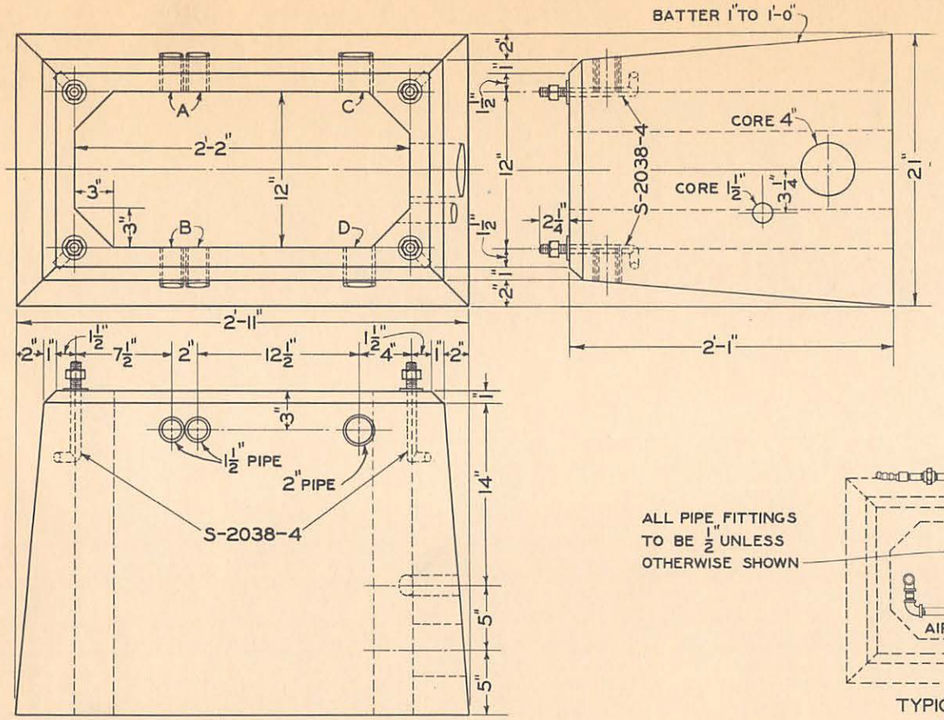
STANDARD LAYOUT FOR STYLE A-1 ELECTRO-PNEUMATIC SWITCH MECHANISM

FOR SINGLE SWITCH

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 18, 1935
CHIEF ENGINEER

SHEET 1 OF 2

S-2323-A

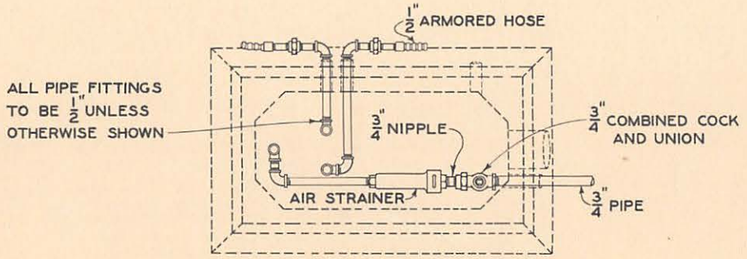


FOUNDATION FOR VALVES

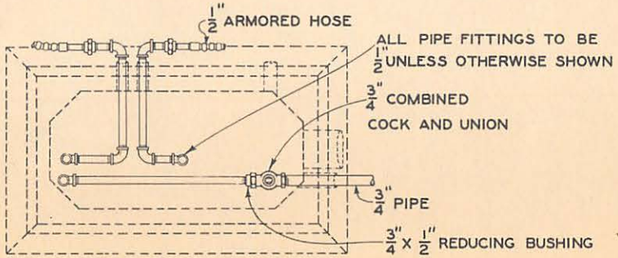
APPROXIMATE CONCRETE 5 CU. FT.
STONE IN AGGREGATE SHALL NOT EXCEED ¾"
SCALE ①

FOUNDATIONS FOR VALVES

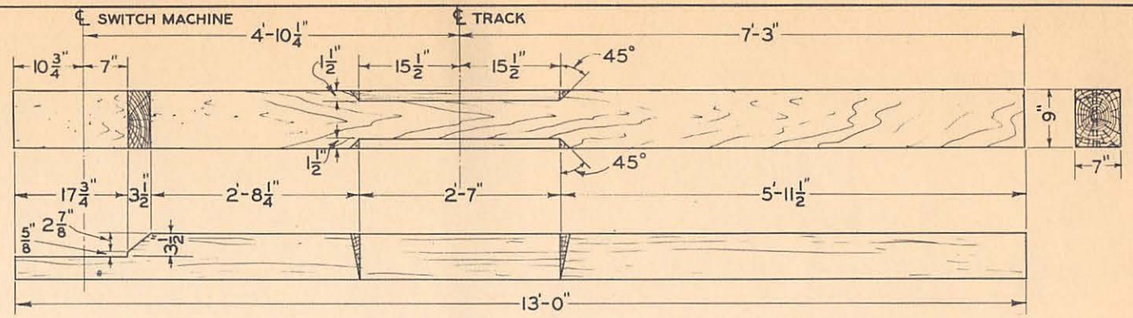
DRAWING NUMBER	FOR USE WITH	CORE HOLES
S-2323-1	ONE L.H. ELECTROPNEUMATIC SWITCH AND LOCK MACHINE	A-C
S-2323-2	ONE R.H. ELECTROPNEUMATIC SWITCH AND LOCK MACHINE	B-D
S-2323-3	ONE L. H. ELECTROPNEUMATIC SWITCH AND LOCK MACHINE AND ONE ADDITIONAL SWITCH AND LOCK MACHINE OPERATED FROM SAME VALVE.	A-B-C
S-2323-4	ONE R.H. ELECTROPNEUMATIC SWITCH AND LOCK MACHINE AND ONE ADDITIONAL SWITCH AND LOCK MACHINE OPERATED FROM SAME VALVE	A-B-D



TYPICAL PLAN OF C VALVE
PIPING IN FOUNDATION
NO SCALE



TYPICAL PLAN OF CP VALVE
PIPING IN FOUNDATION
NO SCALE



S-2323-5 TIE

SCALE ②

NOTES

1. FOUNDATIONS SHALL BE MADE OF PORTLAND CEMENT CONCRETE BY THE WATER CEMENT RATIO METHOD TO TEST 2000 POUNDS PER SQUARE INCH.
2. TOP OF FOUNDATIONS SHALL BE SET 1¾" ABOVE BASE OF RAIL.
3. TIES SHALL BE FURNISHED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-2, SWITCH TIES, AND SHALL BE TREATED, AFTER FRAMING, IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-17, PRESERVATIVE TREATMENT OF CROSS TIES OR SWITCH TIES.
4. PIPING SHOWN IS TYPICAL FOR SWITCH MACHINE LOCATED ON NORMALLY CLOSED POINT SIDE. IF NECESSARY, IN ORDER TO RETAIN A GIVEN VALVE FOR NORMAL OPERATION, REVERSE AIR LEADS TO CYLINDER BY CHANGING CONNECTIONS WITHIN FOUNDATION.

SCALE IN INCHES
① 0 3 6 9 12 15 18
② 0 6 12 24 36

APPROVED FOR USE

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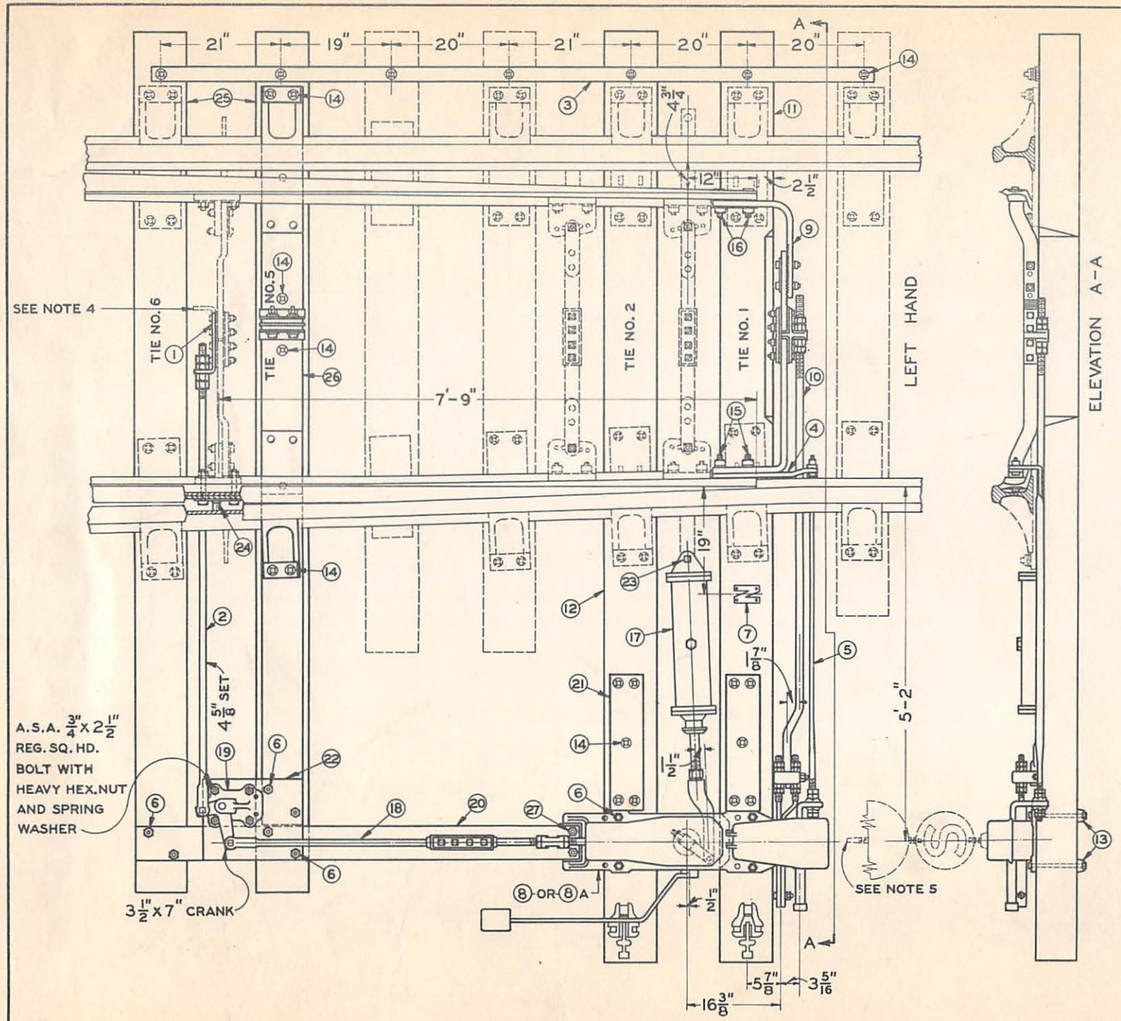
STANDARD LAYOUT FOR STYLE A-1 ELECTRO-PNEUMATIC SWITCH MECHANISM

FOR SINGLE SWITCH

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 18, 1935.
CHIEF ENGINEER

SHEET 2 OF 2
S-2323-A



NOTES

1. LAYOUT SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. ALL ITEMS IN BILL OF MATERIAL ARE INTERCHANGEABLE FOR EITHER LEFT OR RIGHT HAND LAYOUT EXCEPT ITEMS (10), (10)A, (11), (11)A, (12), (12)A.
3. AFTER STARTING, LAG SCREWS SHALL BE SCREWED DOWN THEIR ENTIRE LENGTH INTO HOLES CONTAINING A SMALL AMOUNT OF CREOSOTE. HOLES SHALL BE BORED WITH 5/8" BIT TO A DEPTH OF APPROXIMATELY 5 3/4".
4. SWITCH ADJUSTMENT BRACKET SHALL BE LOCATED AS SHOWN IN DASHED LINES FOR RIGHT HAND LAYOUT.
5. STAFF AND TARGET ARE FURNISHED WITH S-3 MECHANISM ONLY. PURCHASER WILL SPECIFY LENGTH OF STAFF, DETAILS OF TARGET AND POSITION FOR MOUNTING SPRING SWITCH MARKER IF USED. FOR MARKER DETAIL SEE LATEST REVISION OF STANDARD DRAWING S-2063.

BILL OF MATERIAL

FIGUR	DESCRIPTION	REQUIRED	REFERENCE
(1)	ADJUSTMENT BRACKET, COMPLETE WITH 4-1 1/8" A.S.A. HEAVY HEX. NUTS	1	S-2327-38
(2)	SWITCH CONNECTING ROD, COMPLETE WITH PIN AND COTTER	1	S-2327-34
(3)	TIE STRAP 3/4" X 2 1/2" X 10'-4"	1	S-2327-35
(4)	SWITCH POINT LUG, SEE DRILLING TABLE, DETAILED DRAWING SH. 3	1	S-2314
(5)	DETECTOR CONNECTING ROD COMPLETE	1	S-2327-9
(6)	7/8" X 12" MACH. STUD BOLT WITH HEX. NUT, SQ. NUT, AND SP. WASHER	10	S-2301-20
(7)	LETTER PLATE "N" WITH 2 1/2"-#8 FLAT HEAD WOOD SCREWS	1	S-2308-1
(8)	STYLE S-2 MECHANISM, COMPLETE WITH SCREW JAW, NUT AND SP. WASH.	1	———
OR (8) A	STYLE S-3 " " " " " " " " " "	1	———
(9)	FRONT ROD COMPLETE, SEE DETAIL DRAWINGS	1	S-2307-
(10)	L.H. LOCK ROD COMPLETE	1	S-2327-3
OR (10) A	R.H. " " "	1	S-2327-4
(11)	NO. 1 SAWED TREATED TIE 7"X9"X13'-6" FOR L.H. LAYOUT	1	S-2327-27
OR (11) A	NO. 1 " " " " " " " R.H. "	1	S-2327-28
(12)	NO. 2 " " " " " " " L.H. "	1	S-2327-26
OR (12) A	NO. 2 " " " " " " " R.H. "	1	S-2327-29
(13)	CAST IRON WASHER	10	S-2301-19
(14)	LAG SCREW AND SPRING WASHER	23	R-523
(15)	BOLTS, SPECIFY SIZE, SEE DETAILED DRAWING SHEET 1	2	S-2307-
(16)	BOLTS, " " " " " " " "	2	S-2307-
(17)	SPRING SWITCH BUFFER (P.M.CO.) FOR 15/16" HOLE IN 1 1/16" ROD	1	———
(18)	MECHANISM CONNECTING ROD, COMPLETE WITH PIN AND COTTER	1	S-2327-32
(19)	CRANK AND STAND COMPLETE	1	S-2327-41
(20)	MECHANISM CONNECTING PLATE	1	S-2327-24
(21)	TIE PLATE	2	S-2327-30
(22)	CRANK PLATE	1	S-2327-20
(23)	BOLT COMPLETE	1	S-2327-18
(24)	RAIL STOP, SEE DETAIL DRAWING SHEET 5	1	S-2327-
(25)	NO. 5 AND 6 SAWED TREATED TIE 7"X9"X12'-6"	2	S-2327-25
(26)	GAGE PLATE COMPLETE (SEE SHEET 3)	1	S-2327-12
(27)	BOLT COMPLETE WITH INSULATION	2	S-2327-23

SCALE IN INCHES
0 6 12 24 36

APPROVED FOR USE

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STANDARD

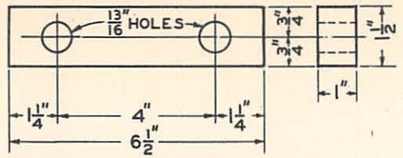
SPRING SWITCH LAYOUT USING S-2 FACING POINT LOCK

APPLIED TO 16'-6" SWITCH, TYPE P. M. BUFFER

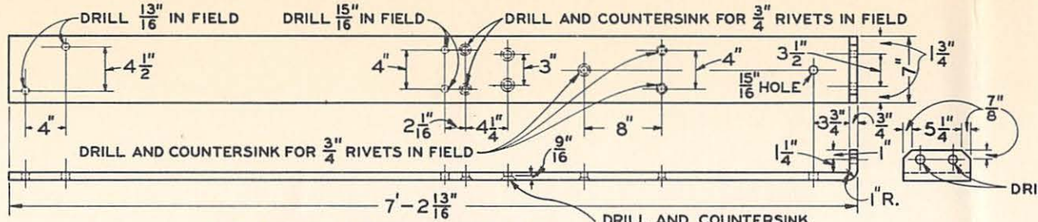
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

CHAIRMAN

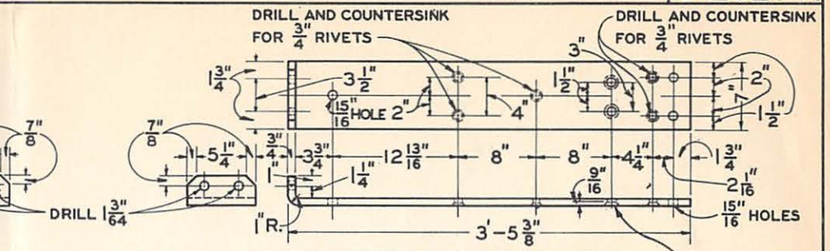
NOV. 9, 1939



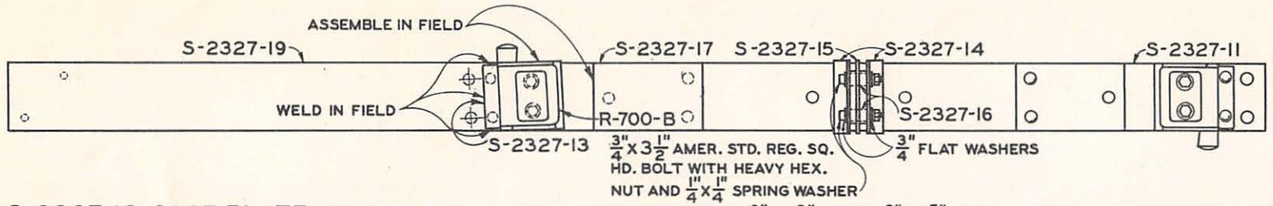
S-2327-13 BUTT PLATE
MILD OPEN-HEARTH STEEL
SCALE (2)



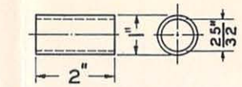
S-2327-19 GAGE PLATE ONLY
MILD OPEN-HEARTH STEEL
SCALE (1)



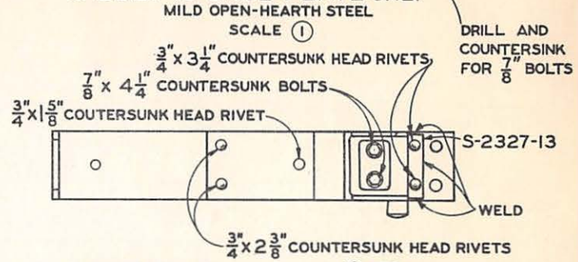
S-2327-10 GAGE PLATE ONLY
MILD OPEN-HEARTH STEEL
SCALE (1)



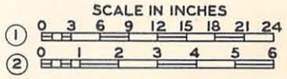
S-2327-12 GAGE PLATE COMPLETE AS SHOWN EXCEPT INCLUDE 2-3/4"x2 3/8" AND 1-3/4"x1 5/8" COUNTERSUNK HEAD RIVETS FOR FASTENING RISER PLATE S-2327-17, AND 2-3/4"x3 1/2" COUNTERSUNK HEAD RIVETS FOR FASTENING BUTT PLATE S-2327-13 TO GAGE PLATE S-2327-19. ALSO 2-7/8"x4 1/4" COUNTERSUNK BOLTS FOR FASTENING RAIL BRACE R-700-B TO GAGE PLATE S-2327-19, WELD BOLT HEADS TO PLATE.
SPECIFY WEIGHT OF RAIL
SCALE (1)

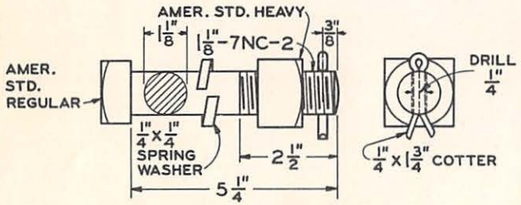


S-2327-16 INSULATION BUSHING
FIBRE
SCALE (2)

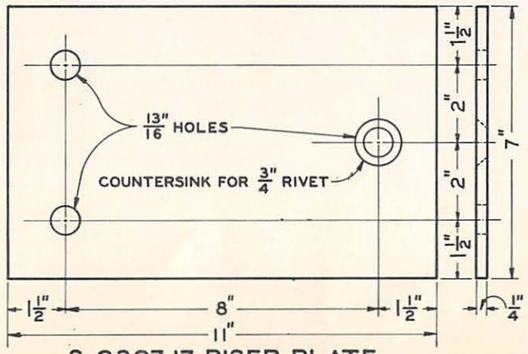


S-2327-11 GAGE PLATE COMPLETE AS SHOWN
SPECIFY WEIGHT OF RAIL
SCALE (1)

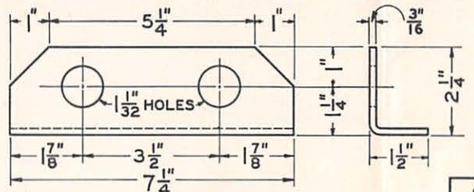




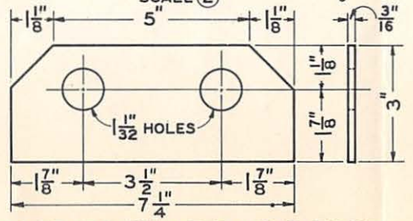
S-2327-18 BOLT COMPLETE
CARBON OR ALLOY STEEL, HEAT TREATED
SCALE (2)



S-2327-17 RISER PLATE
MILD OPEN-HEARTH STEEL
SCALE (2)



S-2327-14 INSULATION ANGLE PLATE
FIBRE
SCALE (2)



S-2327-15 INSULATION END POST
FIBRE
SCALE (2)

NOTES
1. ALL METAL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. FIBRE SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1516, HARD FIBRE.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
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THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
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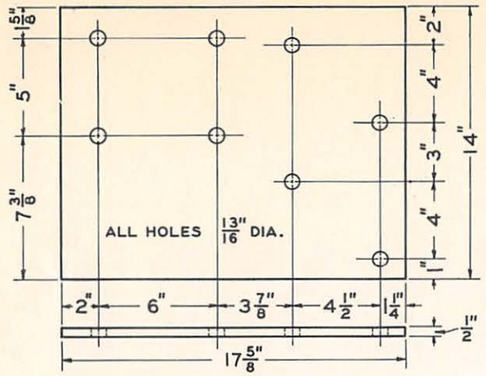
PERE MARQUETTE RAILWAY COMPANY

STANDARD

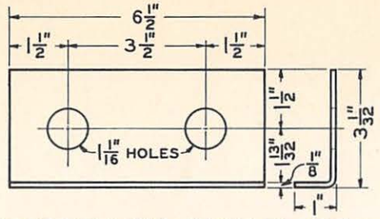
SPRING SWITCH LAYOUT USING S-2 FACING POINT LOCK

APPLIED TO 16'-6" SWITCH, TYPE P.M. BUFFER

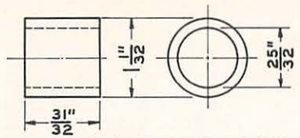
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
CHAIRMAN
NOV. 9, 1939



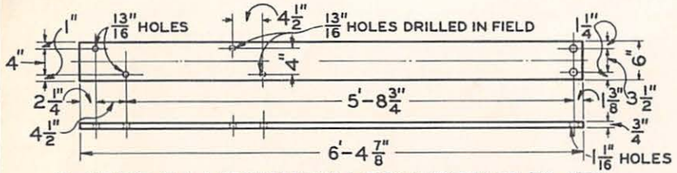
S-2327-20 CRANK PLATE
O.-H. STEEL
SCALE (1)



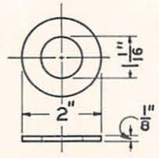
S-2327-22 INSULATION PLATE
FIBRE
SCALE (2)



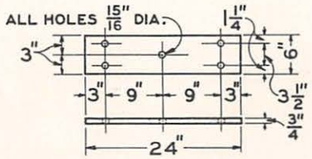
S-2327-31 INSULATION BUSHING
FIBRE
SCALE (4)



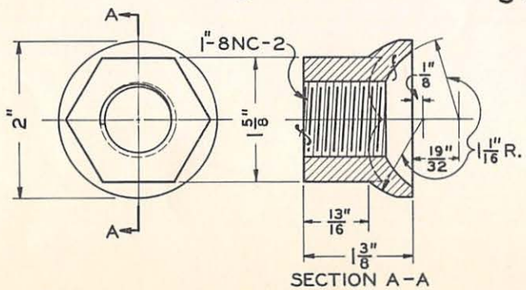
S-2327-24 MECHANISM CONNECTING PLATE
O.-H. STEEL
SCALE (3)



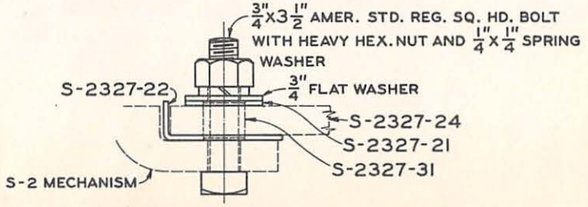
S-2327-21 INSULATION WASHER
FIBRE
SCALE (2)



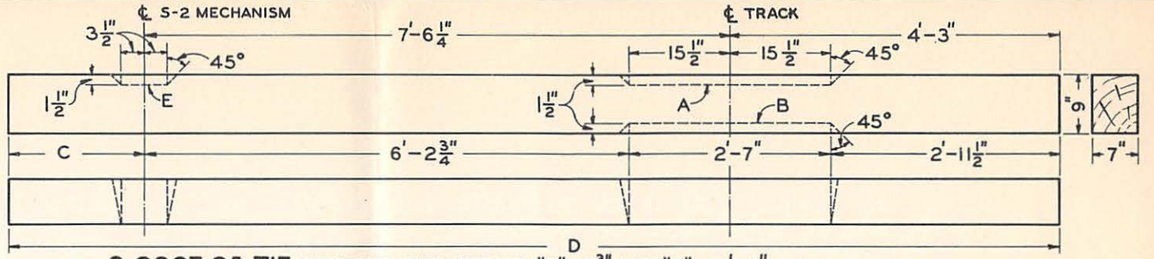
S-2327-30 TIE PLATE
O.-H. STEEL
SCALE (3)



S-2327-42 CUPPED NUT
MALL. IRON
SCALE (4)



S-2327-23 BOLT, COMPLETE WITH HEX. NUT, SPRING WASHER, INSULATION WASHER S-2327-21, FLAT WASHER, INSULATION PLATE S-2327-22, AND INSULATION BUSHING S-2327-31
SCALE (2)

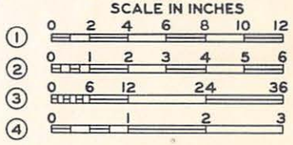


S-2327-25 TIE WITHOUT CHAMFERING, "C"= 8 3/4" AND "D"= 12'-6"
S-2327-26 " " " "C"= 20 3/4" AND "D"= 13'-6"
S-2327-27 " WITH CHAMFERING "B" AND "E" FOR L. H. LAYOUT, "C"= 20 3/4" AND D= 13'-6"
S-2327-28 " " " "A" FOR R. H. LAYOUT, "C"= 20 3/4" AND "D"= 13'-6"
S-2327-29 " " " "E" " " " "C"= 20 3/4" AND "D"= 13'-6"
SCALE (3)

NOTES

1. ALL METAL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. TIES SHALL BE FURNISHED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-2, SWITCH TIES, AND SHALL BE TREATED, AFTER FRAMING, IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-17, PRESERVATIVE TREATMENT OF CROSS TIES OR SWITCH TIES.
3. FIBRE SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1516, HARD FIBRE.

SCALE IN INCHES



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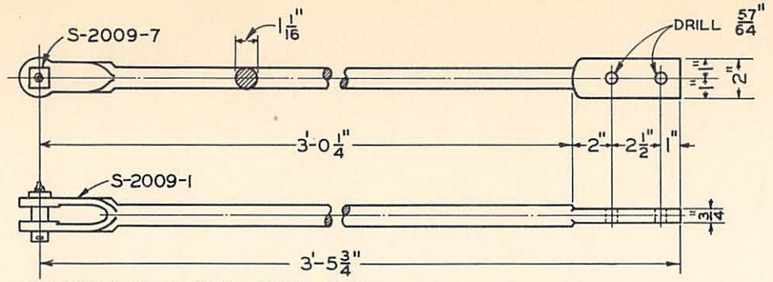
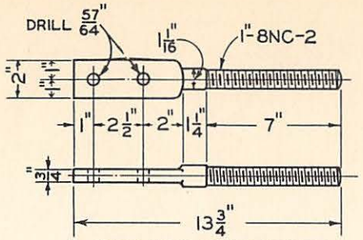
STANDARD
SPRING SWITCH LAYOUT
USING S-2 FACING POINT LOCK

APPLIED TO 16'-6" SWITCH, TYPE P. M. BUFFER

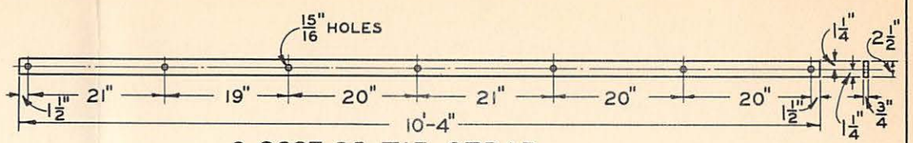
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
CHAIRMAN
NOV. 9, 1939



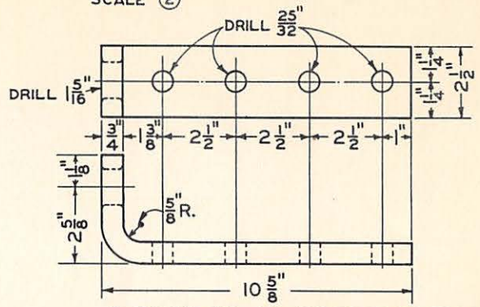
S-2327-33 SOLID JAW ROD COMPLETE AS SHOWN
O.-H. STEEL
SCALE (1)



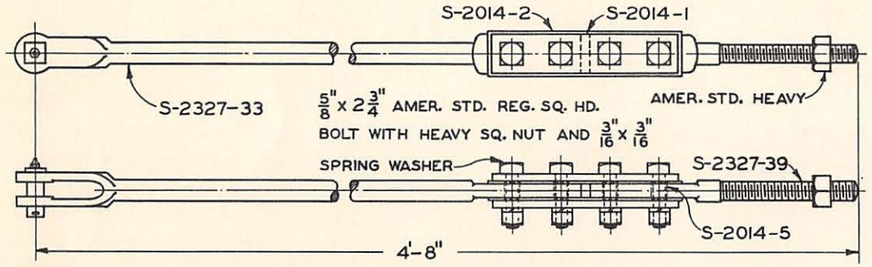
S-2327-39 THREADED END ROD ONLY
O.-H. STEEL
SCALE (1)



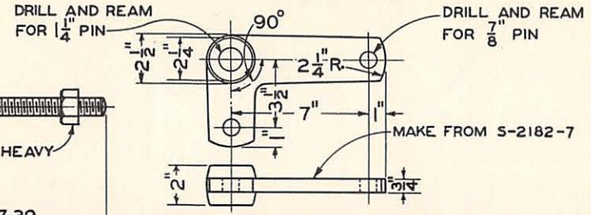
S-2327-35 TIE STRAP
O.-H. STEEL
SCALE (2)



S-2327-38 ADJUSTMENT BRACKET
O.-H. STEEL
SCALE (3)



S-2327-32 MECHANISM CONNECTING ROD COMPLETE AS SHOWN
SCALE (1)

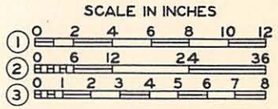


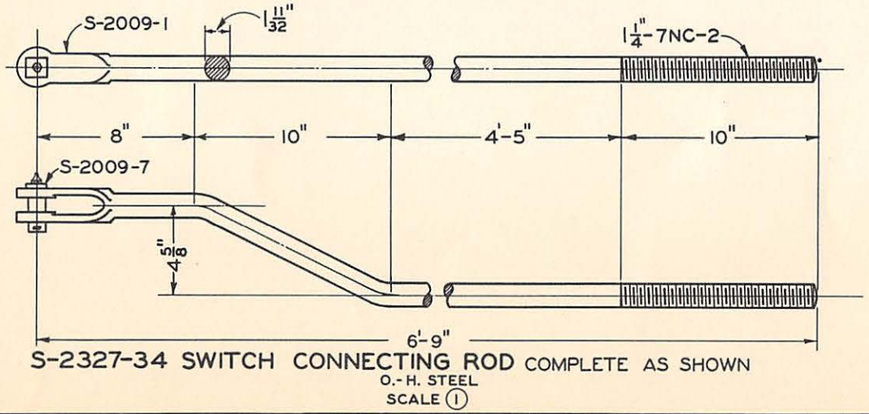
S-2327-40 RIGHT ANGLE CRANK ONLY
S-2327-41 " " "
COMPLETE WITH STAND S-2182-5 AND 1/4" X 3" COTTER.
FORGED STEEL
SCALE (1)

NOTES

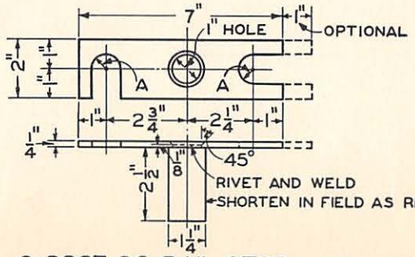
1. ALL METAL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. FIBRE SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1516, HARD FIBRE.

SCALE IN INCHES





S-2327-34 SWITCH CONNECTING ROD COMPLETE AS SHOWN
O.-H. STEEL
SCALE (1)



S-2327-36 RAIL STOP FOR 110 LB. RAIL, "A"=13/32"
S-2327-37 " " FOR 112 LB., 130 LB., AND 131 LB. RAIL, "A"=17/32"
O.-H. STEEL
SCALE (3)

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY VICE PRESIDENT AND GENERAL MANAGER		
ERIE RAILROAD COMPANY VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY VICE PRESIDENT		
C.H.W.	W.S.E.	C.A.T.
C.H.W.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
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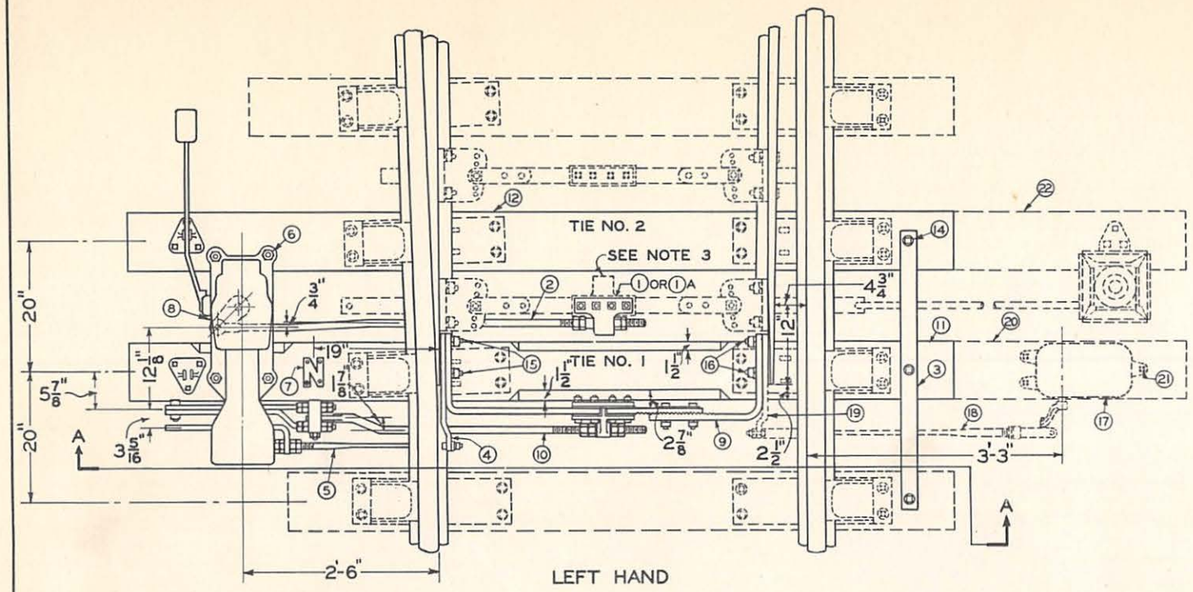
PERE MARQUETTE RAILWAY COMPANY

STANDARD

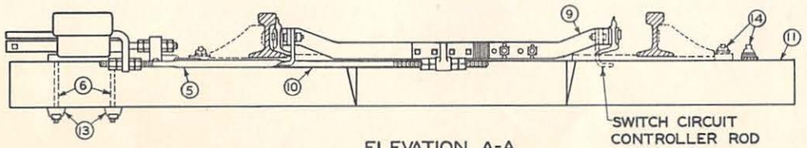
SPRING SWITCH LAYOUT USING S-2 FACING POINT LOCK

APPLIED TO 16'-6" SWITCH, TYPE P.M. BUFFER

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
CHAIRMAN
NOV. 9, 1939



LEFT HAND



ELEVATION A-A

BILL OF MATERIAL

FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(1)	SWITCH ADJUSTMENT BRACKET, OPEN TYPE, COMPLETE WITH SLEEVE AND JAM NUTS	1	S-2301-11
OR (1)A	" " " ENCLOSED TYPE, " " " " " "	1	———
(2)	OPERATING ROD, COMPLETE WITH PIN AND COTTER	1	S-2335-23
(3)	TIE STRAP ¾" X 2½" X 3'-7"	1	S-2309-18
(4)	SWITCH POINT LUG, SEE DRILLING TABLE, DETAILED DRAWINGS, SHEET 3	1	S-2314
(5)	DETECTOR CONNECTING ROD COMPLETE	1	S-2335-14
(6)	¾" X 12" MACHINE STUD BOLT WITH HEX. NUT, SQUARE NUT, AND SPRING WASHER	4	S-2301-20
(7)	LETTER PLATE "N" WITH 2 ½" #8 FLAT HEAD WOOD SCREWS	1	S-2308-1
(8)	STYLE T-10 MECHANISM COMPLETE, SPECIFY R.H. OR L.H.	1	———
(9)	FRONT ROD COMPLETE, SEE DETAIL DRAWINGS	1	S-2307-
(10)	L.H. LOCK ROD COMPLETE	1	S-2335-3
OR (10)A	R.H. " " "	1	S-2335-4
(11)	NO.1 SAWED TREATED TIE 7"X 9"X 10'-6" FOR L.H. LAYOUT	1	S-2335-16
OR (11)A	NO.1 " " " " " " " R.H. "	1	S-2335-17
(12)	NO.2 " " " " " " " L.H. "	1	S-2335-15
OR (12)A	NO.2 " " " " " " " R.H. "	1	S-2335-18
(13)	CAST IRON WASHER	4	S-2301-19
(14)	LAG SCREW AND SPRING WASHER	3	R-523
(15)	BOLTS, SPECIFY SIZE, SEE DETAILED DRAWING SHEET 1	2	S-2307-
(16)	BOLTS, " " " " " " " "	2	S-2307-
	MATERIAL REQUIRED WHEN SWITCH CIRCUIT CONTROLLER IS USED		
(15)	BOLTS, SPECIFY SIZE, SEE DETAILED DRAWING SHEET 1 (SUBSTITUTED FOR REF. (16))	2	S-2307-
(17)	SWITCH CIRCUIT CONTROLLER	1	———
(18)	SWITCH CIRCUIT CONTROLLER ROD COMPLETE	1	S-2306-2
(19)	SWITCH POINT LUG, SEE DRILLING TABLE, DETAILED DRAWINGS SHEET 2	1	S-2306-
(20)	NO.1 SAWED TREATED TIE 7"X 9"X 13'-6" FOR L.H. LAYOUT (SUBSTITUTED FOR REF. (11))	1	S-2335-19
OR (20)A	NO.1 " " " " " " " R.H. " " " " (11)A	1	S-2335-20
(21)	¾"X 6" HOT GALV. GIMLET POINT LAG SCREW WITH CUT THREADS, WITH SPRING WASHER (R-523) AND FLAT WASHER	3	———
	TIES REQUIRED WHEN TARGET IS USED		
(22)	NO. 2 SAWED TREATED TIE 7"X9"X 13'-6" FOR L.H. LAYOUT (SUBSTITUTED FOR REF. (12))	1	S-2335-21
OR (22)A	NO.2 " " " " " " " R.H. " " " " (12)A	1	S-2335-22

NOTES

1. LAYOUT SHALL BE PAINTED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.
2. ALL ITEMS IN BILL OF MATERIAL ARE INTERCHANGEABLE FOR EITHER LEFT OR RIGHT HAND LAYOUT EXCEPT ITEMS (10), (10)A, (11), (11)A, (12), (12)A, (20), (20)A, (22) AND (22)A.
3. SWITCH ADJUSTMENT BRACKET SHALL BE LOCATED AS SHOWN IN DASHED LINES FOR RIGHT HAND LAYOUT.
4. AFTER STARTING, LAG SCREWS SHALL BE SCREWED DOWN THEIR ENTIRE LENGTH INTO HOLES CONTAINING A SMALL AMOUNT OF CREOSOTE. HOLES SHALL BE BORED WITH $\frac{5}{8}$" BIT TO A DEPTH OF APPROXIMATELY $5\frac{3}{4}$".

SCALE IN INCHES
0 6 12 24 36

APPROVED FOR USE

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VICE PRESIDENT AND GENERAL MANAGER

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K. L. M.

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ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

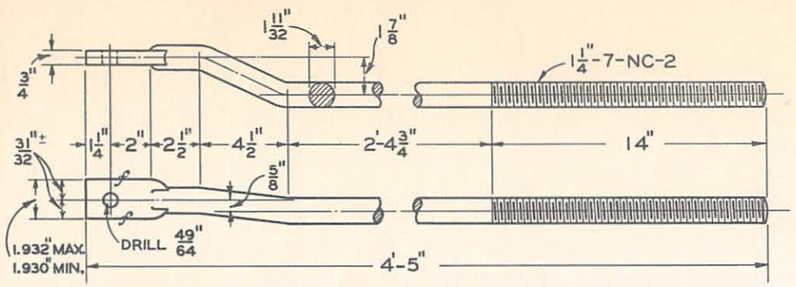
STANDARD

LAYOUT FOR STYLE T-10 HAND OPERATED SWITCH MECHANISM

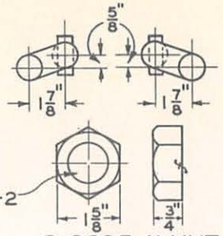
FOR SINGLE SWITCH

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
CHAIRMAN
NOV. 9, 1939

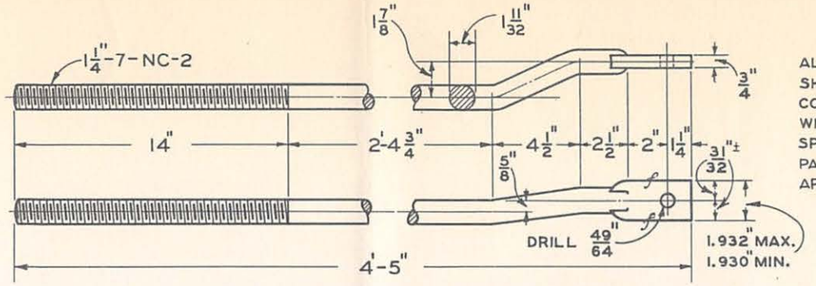
SHEET 1 OF 3
S-2335-A



S-2335-1 LEFT HAND LOCK CONNECTING ROD ONLY



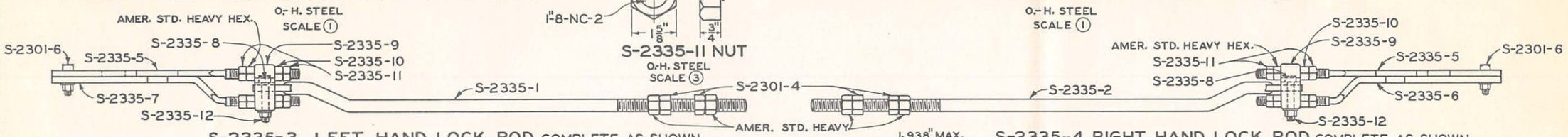
S-2335-11 NUT
O.-H. STEEL
SCALE ③



S-2335-2 RIGHT HAND LOCK CONNECTING ROD ONLY

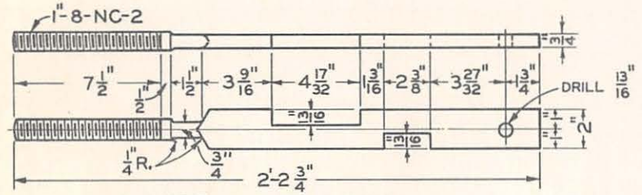
NOTE

ALL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

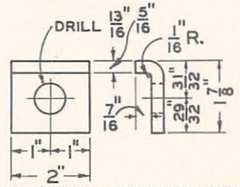


S-2335-3 LEFT HAND LOCK ROD COMPLETE AS SHOWN
SCALE ②

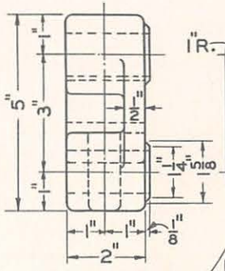
S-2335-4 RIGHT HAND LOCK ROD COMPLETE AS SHOWN
SCALE ②

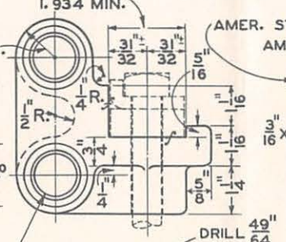


S-2335-5 LOCK ROD
O.-H. STEEL
SCALE ①

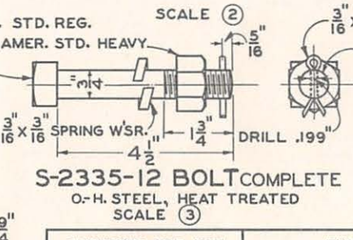


S-2335-8 WASHER
O.-H. STEEL
SCALE ③

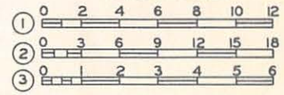


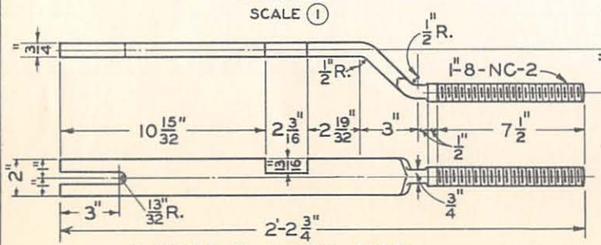


S-2335-9 LUG
MALL. IRON
SCALE ③

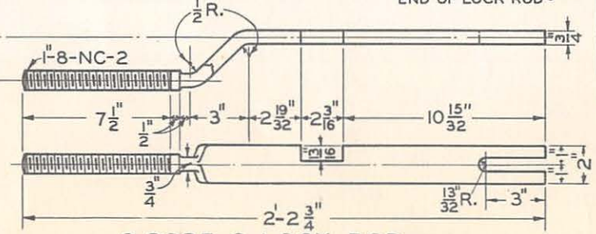


S-2335-12 BOLT COMPLETE
O.-H. STEEL, HEAT TREATED
SCALE ③

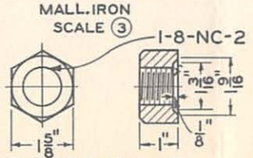




S-2335-7 LOCK ROD L.H.
O.-H. STEEL
SCALE ①



S-2335-6 LOCK ROD R.H.
O.-H. STEEL
SCALE ①



S-2335-10 NUT
O.-H. STEEL
SCALE ③

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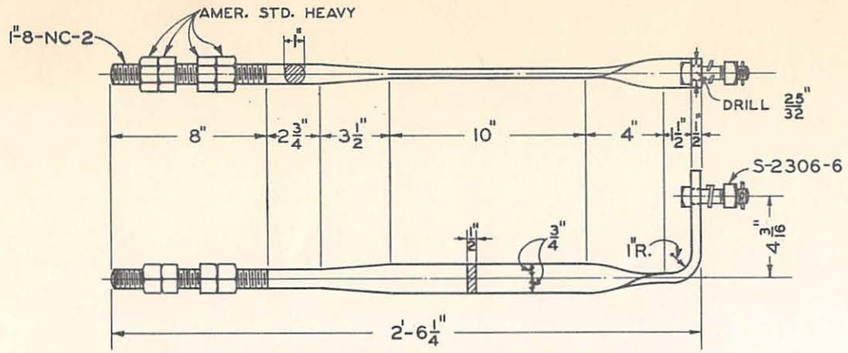
STANDARD

LAYOUT FOR STYLE T-10 HAND OPERATED SWITCH MECHANISM

FOR SINGLE SWITCH

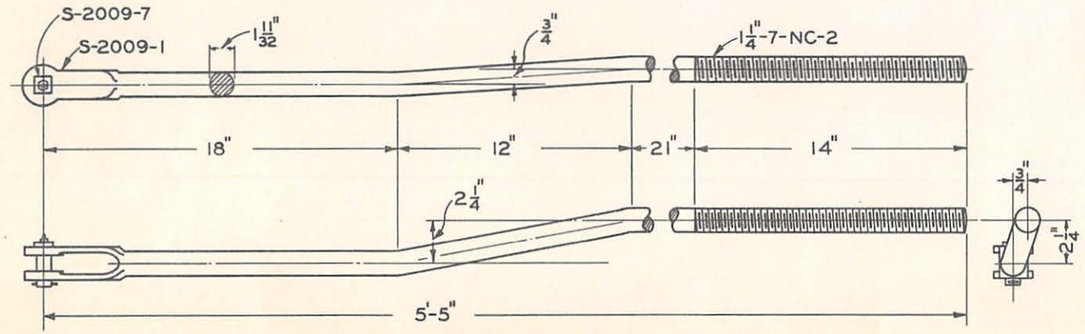
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
A.C. Harvey
CHAIRMAN
NOV. 9, 1939

SHEET 2 OF 3
S-2335-A



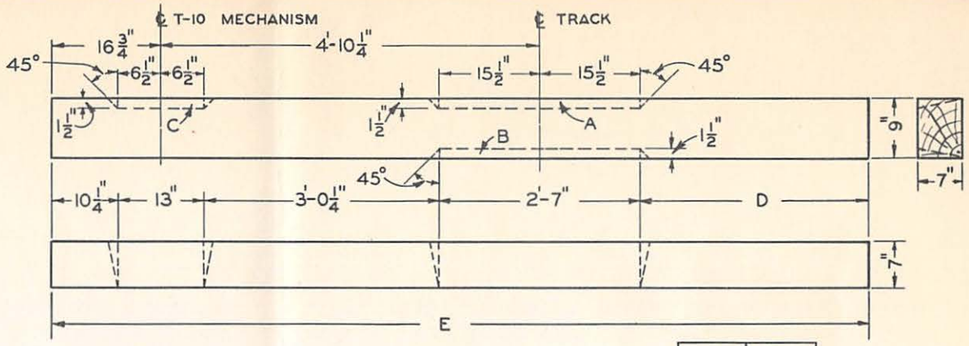
S-2335-13 DETECTOR CONNECTING ROD ONLY
S-2335-14 " " " COMPLETE AS SHOWN

O-H. STEEL
SCALE ①



S-2335 23 OPERATING ROD COMPLETE AS SHOWN

O-H. STEEL
SCALE ①



						D	E
S-2335-15	TIE	WITHOUT CHAMFERING FOR			L.H. LAYOUT	—	10'-6"
S-2335-16	"	WITH CHAMFER	"A,B & C"	"	"	2'-11 1/2"	"
S-2335-17	"	"	"A"	"	R.H.	"	"
S-2335-18	"	"	"A" & "C"	"	"	"	"
S-2335-19	"	"	"A,B & C"	"	L.H.	5'-11 1/2"	13'-6"
S-2335-20	"	"	"A"	"	R.H.	"	"
S-2335-21	"	WITHOUT CHAMFERING FOR			L.H.	—	"
S-2335-22	"	WITH CHAMFER	"A" & "C"	"	R.H.	5'-11 1/2"	"

SCALE ②

NOTES

1. TIES SHALL BE FURNISHED IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-2, SWITCH TIES, AND SHALL BE TREATED, AFTER CHAMFERING IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-17, PRESERVATIVE TREATMENT OF CROSS TIES OR SWITCH TIES.
2. ALL METAL PARTS EXCEPT THREADED PORTIONS SHALL BE FURNISHED PAINTED WITH ONE COAT OF METAL PRIMER IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1510, SHOP AND FIELD PAINTING FOR SIGNAL AND INTERLOCKING APPARATUS.

SCALE IN INCHES
① 0 2 4 6 8 10 12
② 0 6 12 24 36

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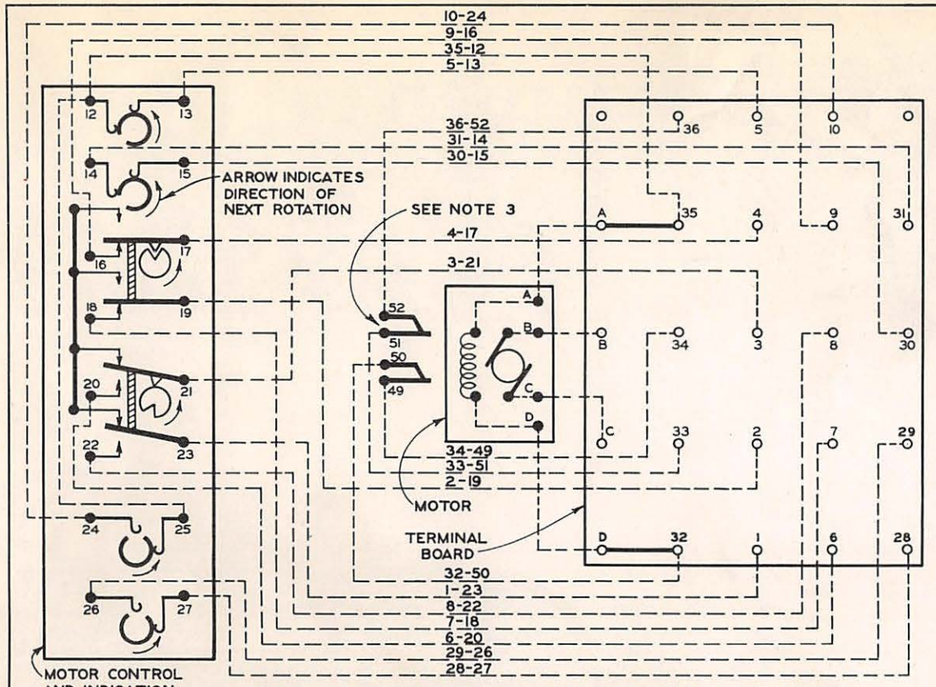
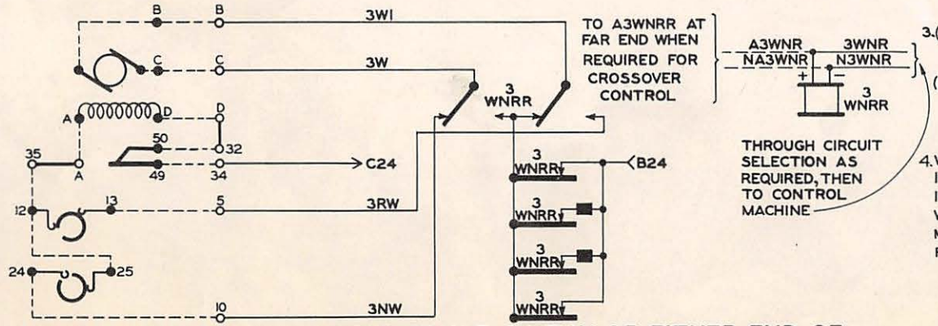
ADVISORY COMMITTEE ON WAY AND STRUCTURES
A C Harvey
CHAIRMAN
NOV. 9, 1939



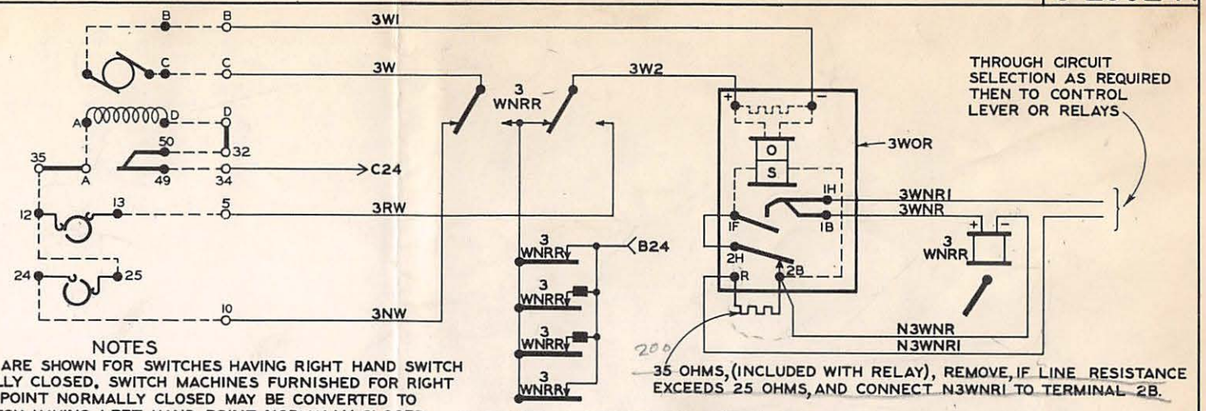
S-2502-1 STANDARD WIRING FOR M-2 AND M-22 SWITCH MECHANISMS

WIRING SHOWN IN DASHED LINES FURNISHED IN MACHINE BY MANUFACTURER



S-2502-3 CONTROL CIRCUIT FOR SINGLE SWITCH OR EITHER END OF CROSSOVER WITHOUT OVERLOAD PROTECTION

FOR USE WITH POWER INTERLOCKING



NOTES

1. ALL CIRCUITS ARE SHOWN FOR SWITCHES HAVING RIGHT HAND SWITCH POINT NORMALLY CLOSED, SWITCH MACHINES FURNISHED FOR RIGHT HAND SWITCH POINT NORMALLY CLOSED MAY BE CONVERTED TO OPERATE SWITCH HAVING LEFT HAND POINT NORMALLY CLOSED AS FOLLOWS: INTERCHANGE EXTERNAL LEADS TO TERMINALS 5 AND 10 AND INTERCHANGE EXTERNAL LEADS TO TERMINALS B AND C. REVERSE INDICATION CONTROLLER CAMS.
2. OPERATION OF MOTOR CONTROL AND INDICATION CIRCUIT CONTACTS SHALL BE AS FOLLOWS:
   (a) MOTOR CONTROL CONTACTS 12-13 AND 24-25 MUST BE CLOSED WHEN SLIDE BAR IS MORE THAN ½ INCH FROM FULL NORMAL OR REVERSE POSITION.
   (b) CONTACT 24-25 MUST BE OPEN WHEN SLIDE BAR IS IN FULL NORMAL POSITION FOR RIGHT HAND SWITCH POINT NORMALLY CLOSED OR FULL REVERSE FOR LEFT HAND SWITCH POINT NORMALLY CLOSED.
   (c) CONTACT 12-13 MUST BE OPEN WHEN SLIDE BAR IS IN FULL REVERSE POSITION FOR RIGHT HAND SWITCH POINT NORMALLY CLOSED OR FULL NORMAL FOR LEFT HAND SWITCH POINT NORMALLY CLOSED.
   (d) INDICATION CIRCUIT CONTACTS 16-17, 18-19, 20-21, AND 22-23 ARE OPERATED BY SLIDE BAR MOVEMENT AS WELL AS POINT DETECTOR ROD AND MUST BE SO ADJUSTED THAT SLIDE BAR MOVEMENT WILL CLOSE THE OPEN MOTOR CONTROL CONTACT BEFORE THE CLOSED INDICATION CIRCUIT CONTACTS OPEN.
3. (a) CONTACTS 49-50 AND 51-52 ON M-2 MACHINE SHALL BE FURNISHED WITH LATCH REQUIRING MAINTAINER TO RESTORE CONTACTS TO NORMAL AFTER USE OF CRANK.
   (b) CONTACTS 49-50 AND 51-52 ON M-22 MACHINE OPEN WHEN SELECTOR LEVER IS PLACED IN HAND OPERATING POSITION AND CLOSE WHEN SELECTOR LEVER IS PLACED IN POWER OPERATING POSITION.
4. WHEN CONDITIONS REQUIRE TRAIN OPERATION BY SIGNAL INDICATION WHILE SELECTOR LEVER OF M-22 MACHINES ARE IN HAND OPERATION POSITION, THE SWITCH REPEATER CIRCUIT WIRING FOR M-22 MACHINES SHALL BE THE SAME AS FOR M-2 MACHINES IN ACCORDANCE WITH NOTE ON EACH SWITCH REPEATER CIRCUIT.

S-2502-2 CONTROL CIRCUIT FOR SINGLE SWITCH WITH OVERLOAD PROTECTION

FOR USE WITH POWER INTERLOCKING AND ALL CODED CONTROL SYSTEMS. THIS CIRCUIT SHALL NOT BE USED WHERE WNRR LINE RESISTANCE EXCEEDS 65 OHMS WITH 10 VOLT BATTERY AT CONTROL POINT, OR 90 OHMS WITH 12 VOLT BATTERY AT CONTROL POINT. IF LINE RESISTANCE EXCEEDS THESE VALUES USE CIRCUIT S-2502-4.

APPARATUS

WNRR = DP-14 OR EQUAL
WOR = OR-11 " "

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K. L. M.		

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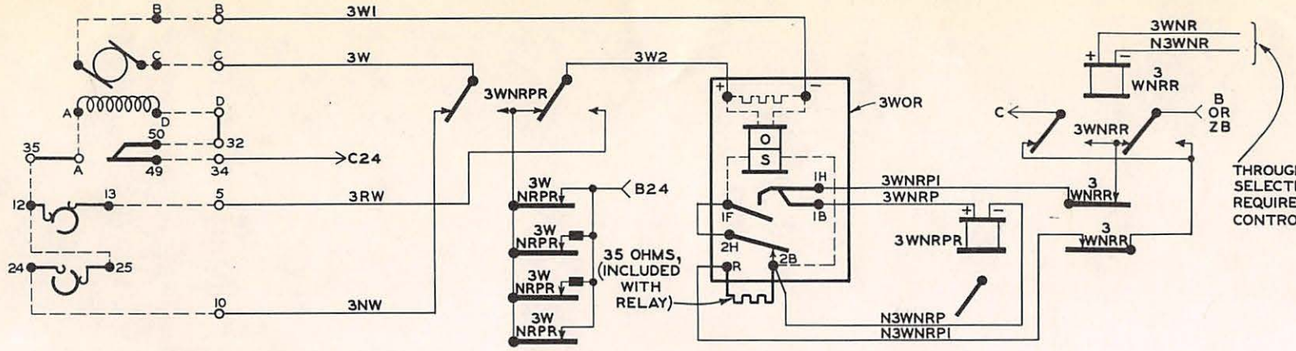
STANDARD TYPICAL CIRCUITS FOR RELAY CONTROLLED M-2 AND M-22 SWITCH MECHANISMS

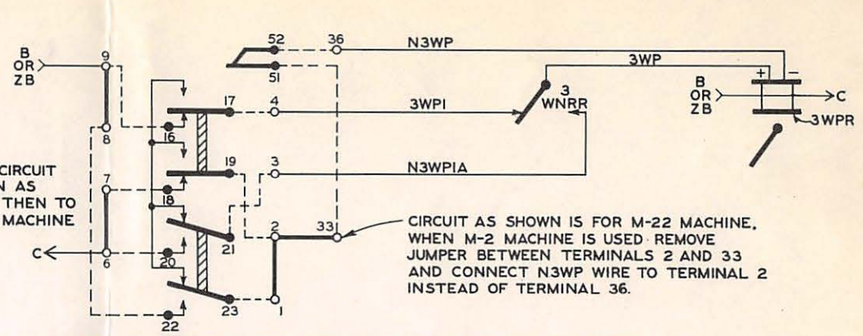
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
CHAIRMAN
NOV. 20, 1940

SHEET 1 OF 6
S-2502-A



S-2502-4 CONTROL CIRCUIT FOR SINGLE SWITCH WITH OVERLOAD PROTECTION

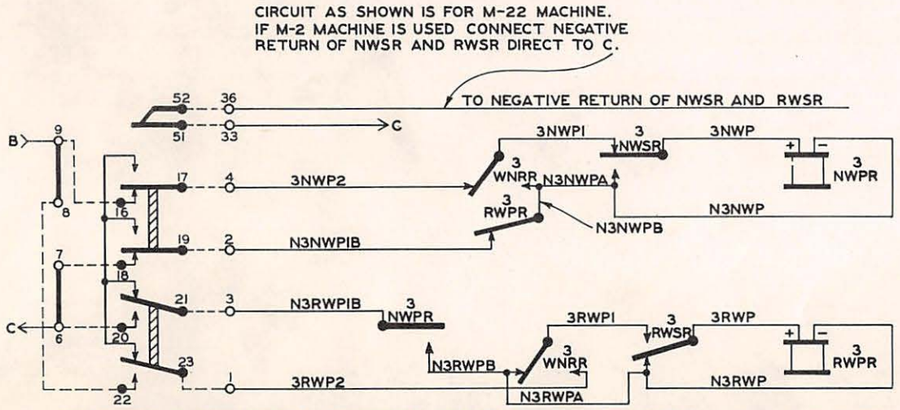
FOR USE WITH ANY CONTROL SYSTEM WHERE WNRR LINE RESISTANCE LIMITATIONS WILL NOT PERMIT USE OF S-2502-2 OR WHERE SERIES APPARATUS REQUIRES CONSTANT LINE CURRENT VALUES


N3WP
3WP
3WPI
N3WPIA
3WNRR
3WPR
CIRCUIT AS SHOWN IS FOR M-22 MACHINE. WHEN M-2 MACHINE IS USED REMOVE JUMPER BETWEEN TERMINALS 2 AND 33 AND CONNECT N3WP WIRE TO TERMINAL 2 INSTEAD OF TERMINAL 36.

S-2502-5 POLARIZED SWITCH REPEATER CIRCUIT FOR SINGLE SWITCH

FOR USE WITH ANY NON-CODED CONTROL SYSTEM WITH SWITCH CONTROL CIRCUIT S-2502-2 OR S-2502-3

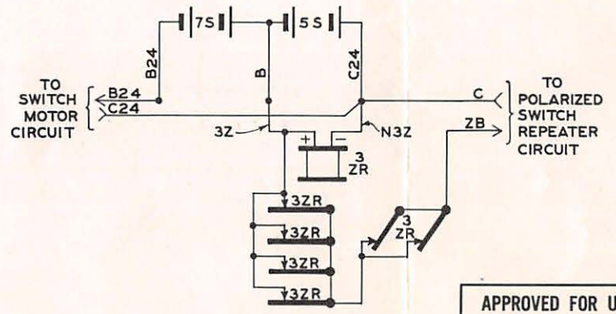
SEE NOTE 4, SHEET 1.



S-2502-6 NEUTRAL SWITCH REPEATER CIRCUITS FOR SINGLE SWITCH

FOR USE WITH TIME CODE CONTROL SYSTEMS WITH SWITCH CONTROL CIRCUIT S-2502-2

SEE NOTE 4, SHEET 1.



S-2502-7 SPLIT BATTERY CIRCUIT

FOR USE WHERE SIGNAL BATTERY IS NOT AVAILABLE FOR POLARIZED SWITCH REPEATER CIRCUITS

APPARATUS

WNRR	= DP-14	OR EQUAL
WNRPR	= DP-14	" "
WOR	= OR-11	" "
WPR	= DP-17	" "
NWPR	= DN-11	" "
RWPR	= DN-11	" "
ZR	= DP-14	" "

SEE NOTES ON SHEET 1

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STANDARD

TYPICAL CIRCUITS FOR RELAY CONTROLLED M-2 AND M-22 SWITCH MECHANISMS

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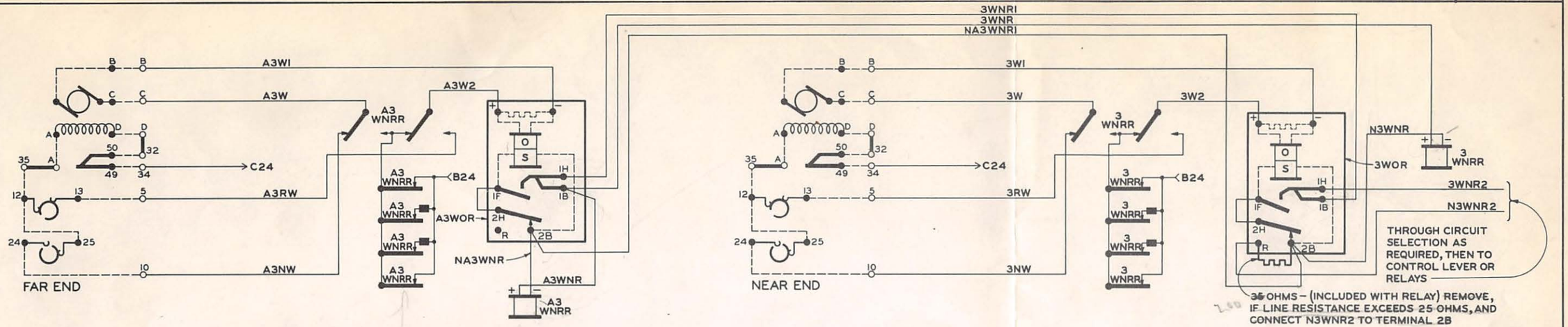
CHAIRMAN
NOV. 20, 1940



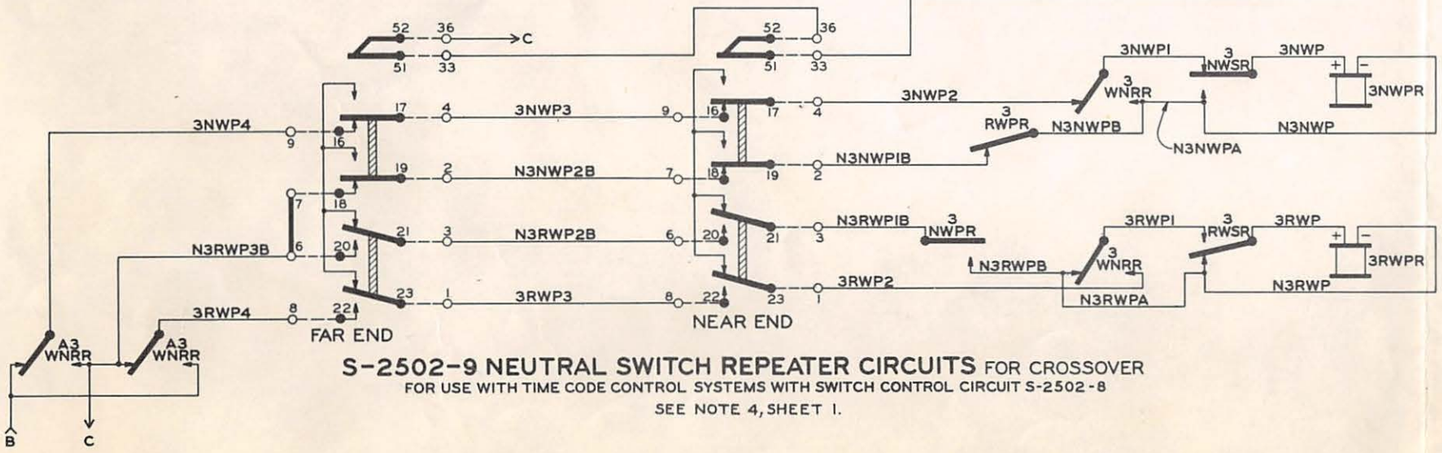
S-2502-8 CONTROL CIRCUIT FOR CROSSOVER WITH OVERLOAD PROTECTION

FOR USE WITH POWER INTERLOCKING AND ALL CODED CONTROL SYSTEMS.

THIS CIRCUIT SHALL NOT BE USED WHERE WNRR LINE RESISTANCE EXCEEDS 65 OHMS WITH 10 VOLT BATTERY AT CONTROL POINT, OR 90 OHMS WITH 12 VOLT BATTERY AT CONTROL POINT. IF LINE RESISTANCE EXCEEDS THESE VALUES USE CIRCUIT S-2502-10

CIRCUIT AS SHOWN IS FOR M-22 MACHINE, IF M-2 MACHINE IS USED CONNECT NEGATIVE RETURN OF NWSR AND RWSR DIRECT TO C

TO NEGATIVE RETURN OF NWSR AND RWSR



S-2502-9 NEUTRAL SWITCH REPEATER CIRCUITS FOR CROSSOVER

FOR USE WITH TIME CODE CONTROL SYSTEMS WITH SWITCH CONTROL CIRCUIT S-2502-8

SEE NOTE 4, SHEET 1.

APPARATUS

WOR = OR-11 OR EQUAL
WNRR = DP-14 OR EQUAL DP-25
NWPR = DN-11 " "
RWPR = DN-11 " "

SEE NOTES ON SHEET 1

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STANDARD

TYPICAL CIRCUITS FOR RELAY CONTROLLED M-2 AND M-22 SWITCH MECHANISMS

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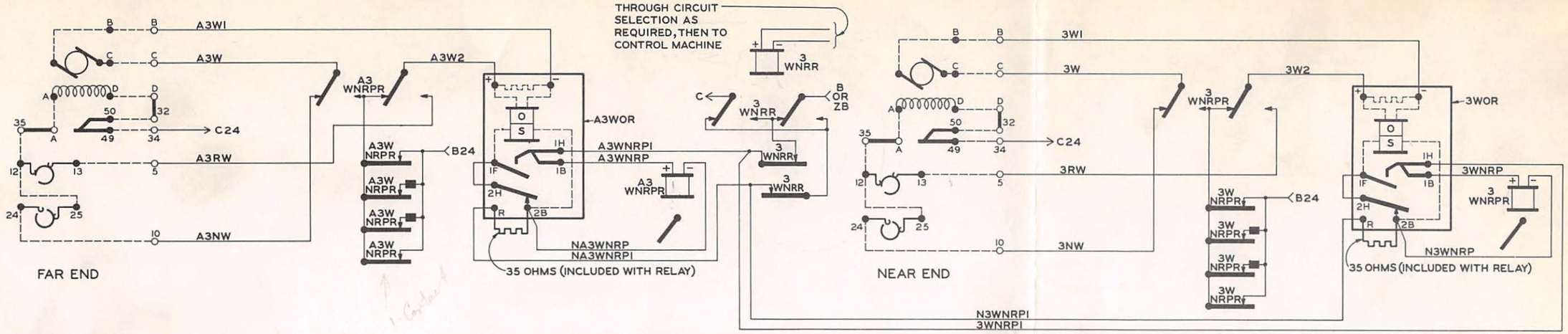
SHEET 3 OF 6
S-2502-A

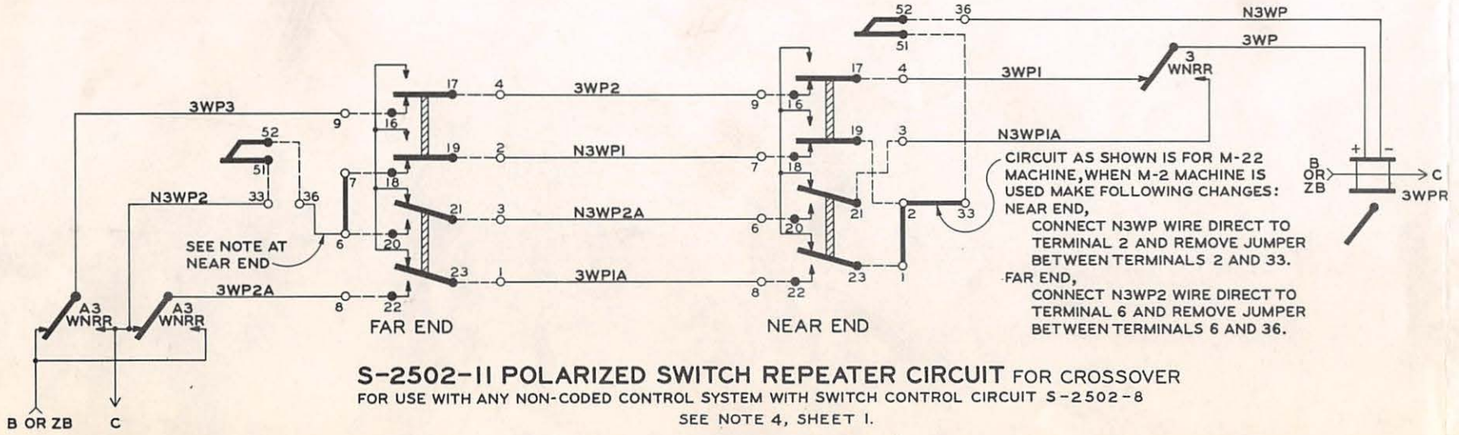


S-2502-10 CONTROL CIRCUIT FOR CROSSOVER WITH OVERLOAD PROTECTION

FOR USE WITH ANY CONTROL SYSTEM WHERE WNRR LINE RESISTANCE LIMITATIONS WILL NOT PERMIT USE OF S-2502-8 OR WHERE SERIES APPARATUS REQUIRES CONSTANT LINE CURRENT VALUES

APPARATUS

WOR = OR-11 OR EQUAL
WNRR = DP-14 " "
WNRPR = DP-14 " "
WPR = DP-17 " "



S-2502-11 POLARIZED SWITCH REPEATER CIRCUIT FOR CROSSOVER

FOR USE WITH ANY NON-CODED CONTROL SYSTEM WITH SWITCH CONTROL CIRCUIT S-2502-8
SEE NOTE 4, SHEET 1.

SEE NOTES ON SHEET 1

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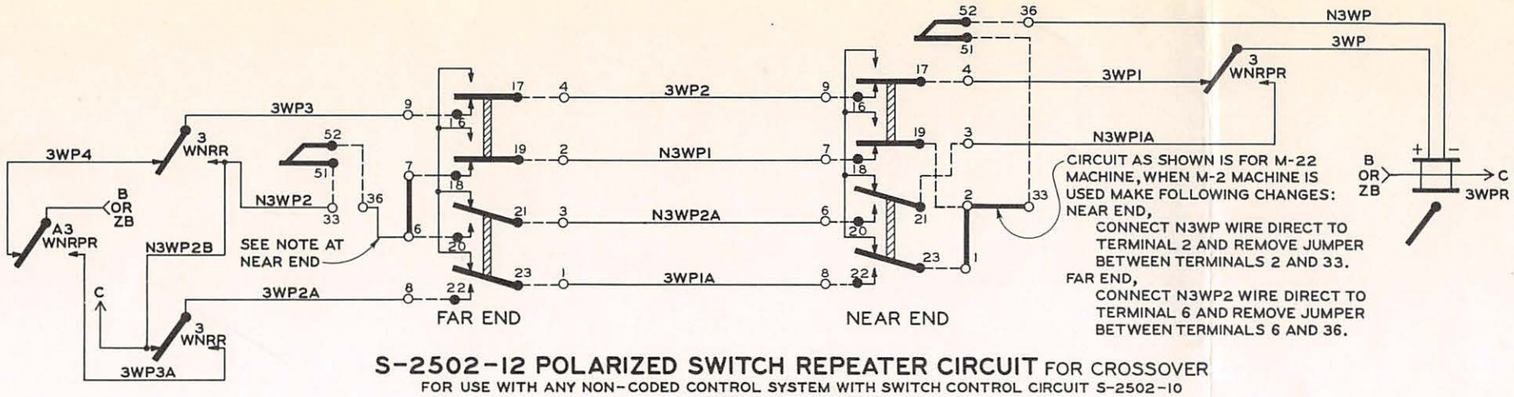
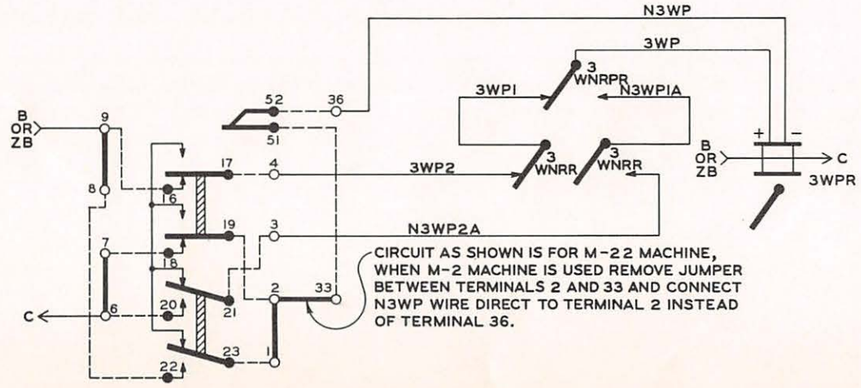


S-2502-12 POLARIZED SWITCH REPEATER CIRCUIT FOR CROSSOVER

FOR USE WITH ANY NON-CODED CONTROL SYSTEM WITH SWITCH CONTROL CIRCUIT S-2502-10
SEE NOTE 4, SHEET 1.



S-2502-13 POLARIZED SWITCH REPEATER CIRCUIT FOR SINGLE SWITCH

FOR USE WITH ANY NON-CODED CONTROL SYSTEM WITH SWITCH CONTROL CIRCUIT S-2502-4
SEE NOTE 4, SHEET 1.

APPARATUS
WPR=DP-17 OR EQUAL

SEE NOTES ON SHEET 1

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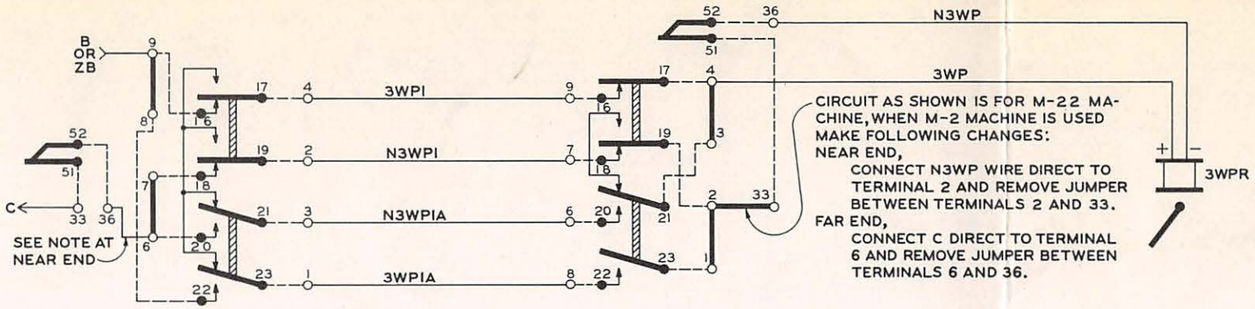
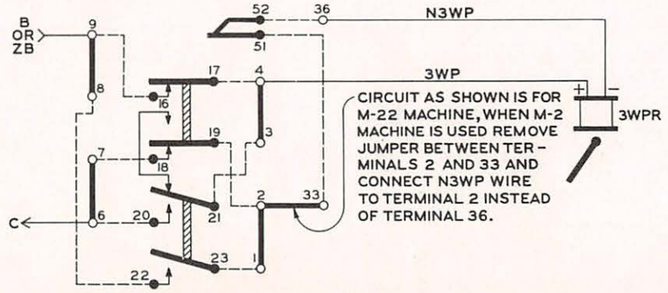
CHAIRMAN
NOV. 20, 1940


B OR ZB
C
SEE NOTE AT NEAR END
3WPI
N3WPI
N3WPIA
3WPIA
N3WP
3WP
3WPR
CIRCUIT AS SHOWN IS FOR M-22 MACHINE, WHEN M-2 MACHINE IS USED MAKE FOLLOWING CHANGES:
NEAR END,
CONNECT N3WP WIRE DIRECT TO TERMINAL 2 AND REMOVE JUMPER BETWEEN TERMINALS 2 AND 33.
FAR END,
CONNECT C DIRECT TO TERMINAL 6 AND REMOVE JUMPER BETWEEN TERMINALS 6 AND 36.

S-2502-14 POLARIZED SWITCH REPEATER CIRCUIT FOR CROSSOVER

FOR USE ONLY WITH LEVER EQUIPPED WITH QUICK SWITCH
SEE NOTE 4, SHEET 1.

APPARATUS
WPR=DP-14 OR EQUAL


B OR ZB
C
N3WP
3WP
3WPR
CIRCUIT AS SHOWN IS FOR M-22 MACHINE, WHEN M-2 MACHINE IS USED REMOVE JUMPER BETWEEN TERMINALS 2 AND 33 AND CONNECT N3WP WIRE TO TERMINAL 2 INSTEAD OF TERMINAL 36.

S-2502-15 POLARIZED SWITCH REPEATER CIRCUIT FOR SINGLE SWITCH

FOR USE ONLY WITH LEVER EQUIPPED WITH QUICK SWITCH
SEE NOTE 4 SHEET 1.

SEE NOTES ON SHEET 1

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THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
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PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
J. J. Bowman
VICE PRESIDENT

K.L.M. | C.D.M. | C.A.T.
C.B.P.

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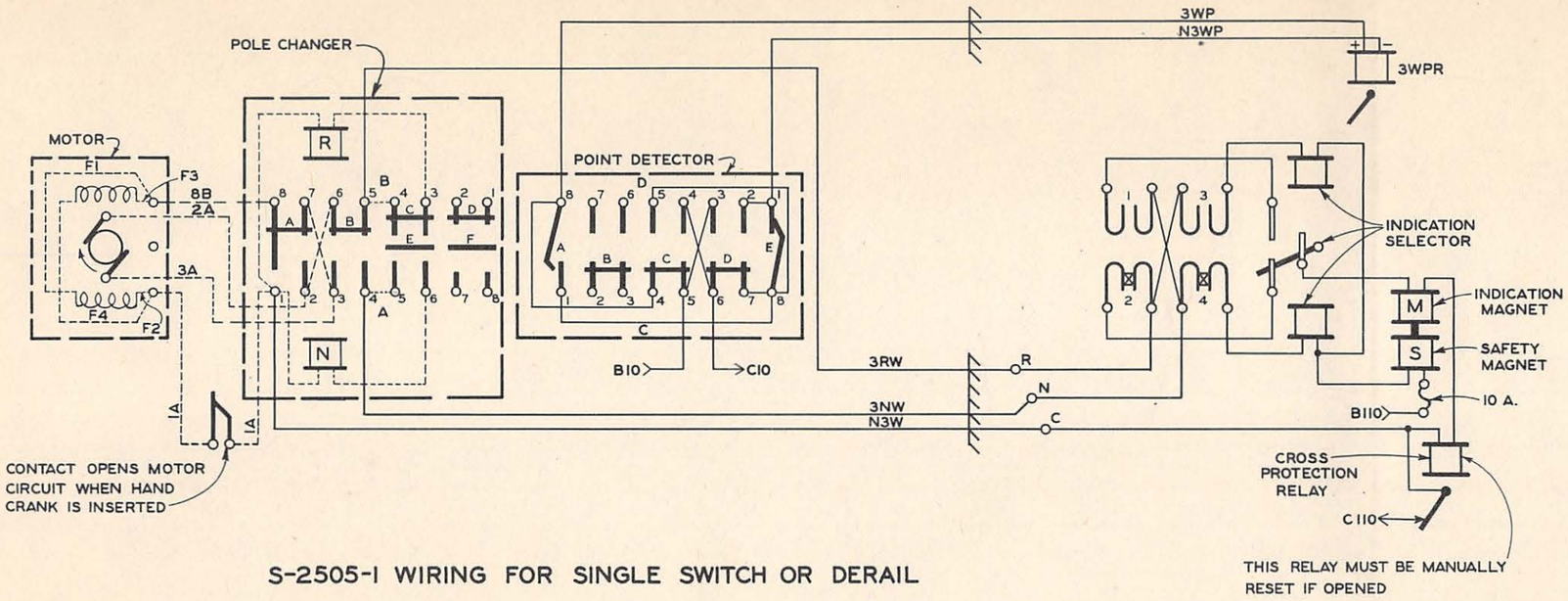
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

TYPICAL CIRCUITS FOR RELAY CONTROLLED M-2 AND M-22 SWITCH MECHANISMS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
A. G. Harvey
CHAIRMAN
NOV. 20, 1940



S-2505-1 WIRING FOR SINGLE SWITCH OR DERAIL

NOTES

1. DOTTED PORTION OF WIRING FURNISHED IN MACHINE BY MANUFACTURER.
2. ADDITIONAL WIRING SHOWN SOLID.
3. WIRING AS SHOWN IS FOR RIGHT HAND SWITCH LAYOUT; FOR LEFT HAND SWITCH LAYOUT INTERCHANGE NW AND RW WIRES, ALSO INTERCHANGE WP AND NWP WIRES.
4. CONTACT OPERATION OF POINT DETECTOR AND POLE CHANGER CIRCUIT CONTROLLERS IS AS FOLLOWS:

NORMAL TO REVERSE

(a) POLE CHANGER BAR E CLOSES CONTACTS 5-6 WHEN SLIDE BAR MOVES $\frac{1}{2}$" TOWARD THE UNLOCKED POSITION.

(b) JUST AFTER POLE CHANGER CONTACTS 5-6 ARE CLOSED BY BAR E, POINT DETECTOR BARS C AND D MOVE TO CENTER POSITION; OPENING CONTACTS 4-5 AND 6-7; AFTER WHICH SHUNT CONTACT A CLOSES.

(c) POINT DETECTOR BARS C AND D CLOSE CONTACTS 5-4 AND 3-2 JUST AFTER SHUNT CONTACT E OPENS WHEN SLIDE BAR IS WITHIN $\frac{1}{2}$" OF FULL REVERSE LOCKED POSITION.

(d) POLE CHANGER BAR C OPENS CONTACTS 4-3 JUST AFTER POINT DETECTOR BARS C AND D CLOSE CONTACTS 5-4 AND 3-2.

(e) POLE CHANGER BARS A AND B ARE MECHANICALLY MOVED TO REVERSE POSITION CLOSING CONTACTS 8-2 AND 3-4 AND OPENING CONTACTS 8-7 AND 6-5, JUST AFTER BAR C OPENS CONTACTS 4-3.

REVERSE TO NORMAL

(f) OPERATION OF CONTACTS IS IN THE SAME SEQUENCE AS OUTLINED ABOVE EXCEPT IN THE REVERSE DIRECTION.

5. POLE CHANGER COIL R OR N MOVE BARS A AND B WHEN CONTROL LEVER IS REVERSED IN MID-STROKE, REVERSING DIRECTION OF OPERATION OF THE MECHANISM AND KEEPING MECHANISM AND LEVER IN CORRESPONDENCE.

APPROVED FOR USE

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VICE PRESIDENT

ERIE RAILROAD COMPANY
R L Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
G D Brooke
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A J Bowman
VICE PRESIDENT

K.L.M.	C.D.M.	A.J.P.
K.L.M.		

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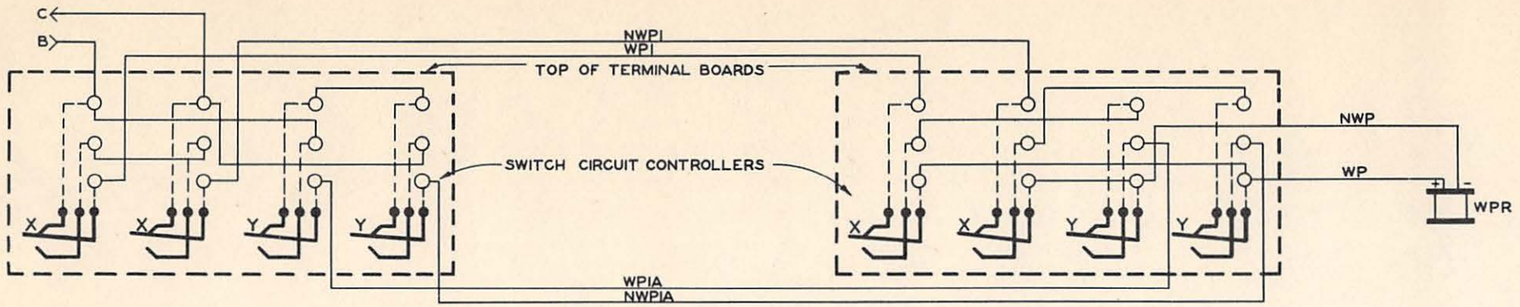
PERE MARQUETTE RAILWAY COMPANY

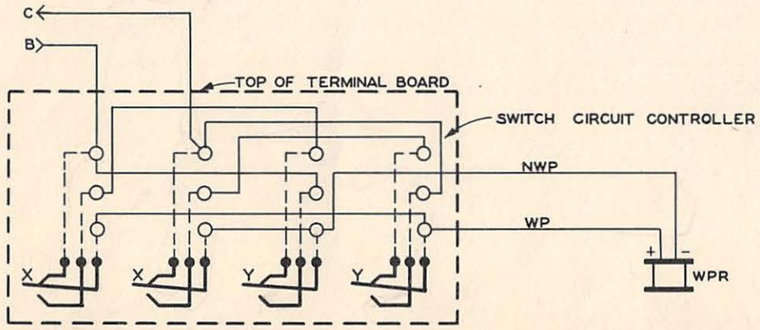
STANDARD WIRING FOR 5A SWITCH MECHANISM WITH DYNAMIC INDICATION

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E W Kitchel, CHIEF ENGINEER OCT. 7, 1935.

S-2505



S-2520-3 WP CIRCUIT FOR CROSSOVER OR SWITCH AND DERAIL



S-2520-4 WP CIRCUIT FOR SINGLE SWITCH OR DERAIL

NOTES

1. ADJUSTMENT OF CONTACTS SHALL BE AS FOLLOWS:
   (a) CONTACTS "X" AND "Y" SHALL BE NORMALLY CLOSED AS SHOWN. WHEN SWITCH POINTS ARE LESS THAN $\frac{1}{4}$ INCH FROM FULL NORMAL TO FULL NORMAL POSITION.
   (b) CONTACTS "X" SHALL BE CLOSED IN THE OPPOSITE POSITION WHEN SWITCH POINTS ARE $\frac{1}{4}$ INCH OR MORE FROM FULL NORMAL POSITION.
   (c) CONTACTS "Y" SHALL BE CLOSED IN OPPOSITE POSITION WHEN SWITCH POINTS ARE LESS THAN $\frac{1}{4}$ INCH FROM FULL REVERSE TO FULL REVERSE POSITION.

CIRCUIT FOR USE WHEN TYPE U-3 AND U-5 SWITCH CIRCUIT CONTROLLERS ARE LOCATED ON CLOSED POINT SIDE OF SWITCH.

APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Brooke, VICE PRESIDENT	
ERIE RAILROAD COMPANY — R Ellwoodruff, VICE PRESIDENT	
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D Brooke, VICE PRESIDENT	
PERE MARQUETTE RAILWAY COMPANY — A Bowman, VICE PRESIDENT	
C.H.W. / C.H.W.	C.D.M. / A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

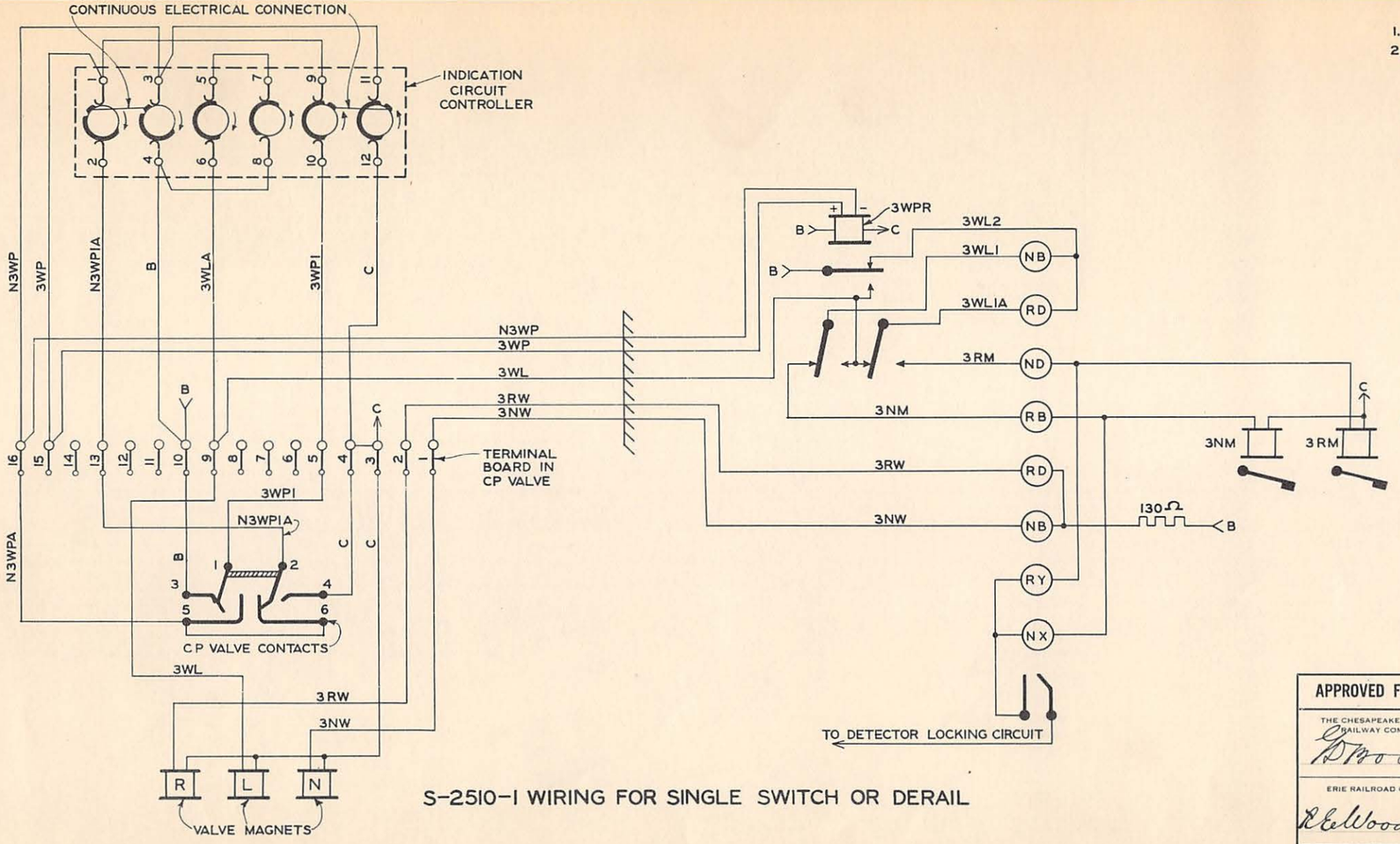
STANDARD

WP CIRCUITS USING SWITCH CIRCUIT CONTROLLERS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: C Duncan, CHIEF ENGINEER OCT. 7, 1935.

SHEET 2 OF 2

S-2520



S-2510-1 WIRING FOR SINGLE SWITCH OR DERAIL

NOTES

1. WIRING SHOWN IS FOR EITHER RIGHT OR LEFT HAND LAYOUT.
2. CONTACT OPERATION OF INDICATION CIRCUIT CONTROLLER IS AS FOLLOWS:-

NORMAL TO REVERSE

(a) CONTACTS 1-2 AND 3-4 CLOSE REVERSE INDICATION CIRCUIT AT END OF SLIDE BAR MOVEMENT. IN FULL REVERSE POSITION CONTACTS ARE CLOSED $\frac{1}{8}$" MEASURED ON THE DRUM.

(b) CONTACTS 5-6 OPEN REVERSE RESTORING CIRCUIT JUST AFTER CONTACTS 1-2 AND 3-4 CLOSE. IN FULL REVERSE POSITION CONTACTS 5-6 ARE OPEN $\frac{1}{16}$" MEASURED ON THE DRUM.

REVERSE TO NORMAL

(c) CONTACTS 9-10 AND 11-12 CLOSE NORMAL INDICATION CIRCUIT AT END OF SLIDE BAR MOVEMENT. IN FULL NORMAL POSITION CONTACTS ARE CLOSED $\frac{1}{8}$" MEASURED ON THE DRUM.

(d) CONTACTS 7-8 OPEN NORMAL RESTORING CIRCUIT JUST AFTER CONTACTS 9-10 AND 11-12 CLOSE. AT FULL NORMAL POSITION CONTACTS 7-8 ARE OPEN $\frac{1}{16}$" MEASURED ON THE DRUM.

SHUNT CONTACTS

(e) CONTACTS 1-3 AND 9-11 SHUNT INDICATION CIRCUIT JUST AFTER INDICATION CIRCUIT CONTACTS OPEN.

(f) ADDITIONAL SHUNTING SEGMENTS ARE USED ON CONTROLLERS APPLIED AT INTERMEDIATE OR FAR END OF A COMBINATION INVOLVING THE OPERATION OF TWO OR MORE SWITCH MACHINES FROM THE SAME LEVER. CONTACTS 1-3 SHUNT REVERSE INDICATION CIRCUIT DURING TIME NORMAL INDICATION CONTACTS ARE CLOSED AND CONTACTS 9-11 SHUNT NORMAL INDICATION CIRCUIT DURING TIME REVERSE INDICATION CONTACTS ARE CLOSED. THESE SHUNTING SEGMENTS MUST BE REMOVED FROM ALL CONTROLLERS USED ON SINGLE SWITCH OR DERAIL OR ON THE NEAR END OF A COMBINATION OPERATED FROM THE SAME LEVER.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT

ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

K.L.M.	C.D.M.	A.J.P.
K.L.M.		

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ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

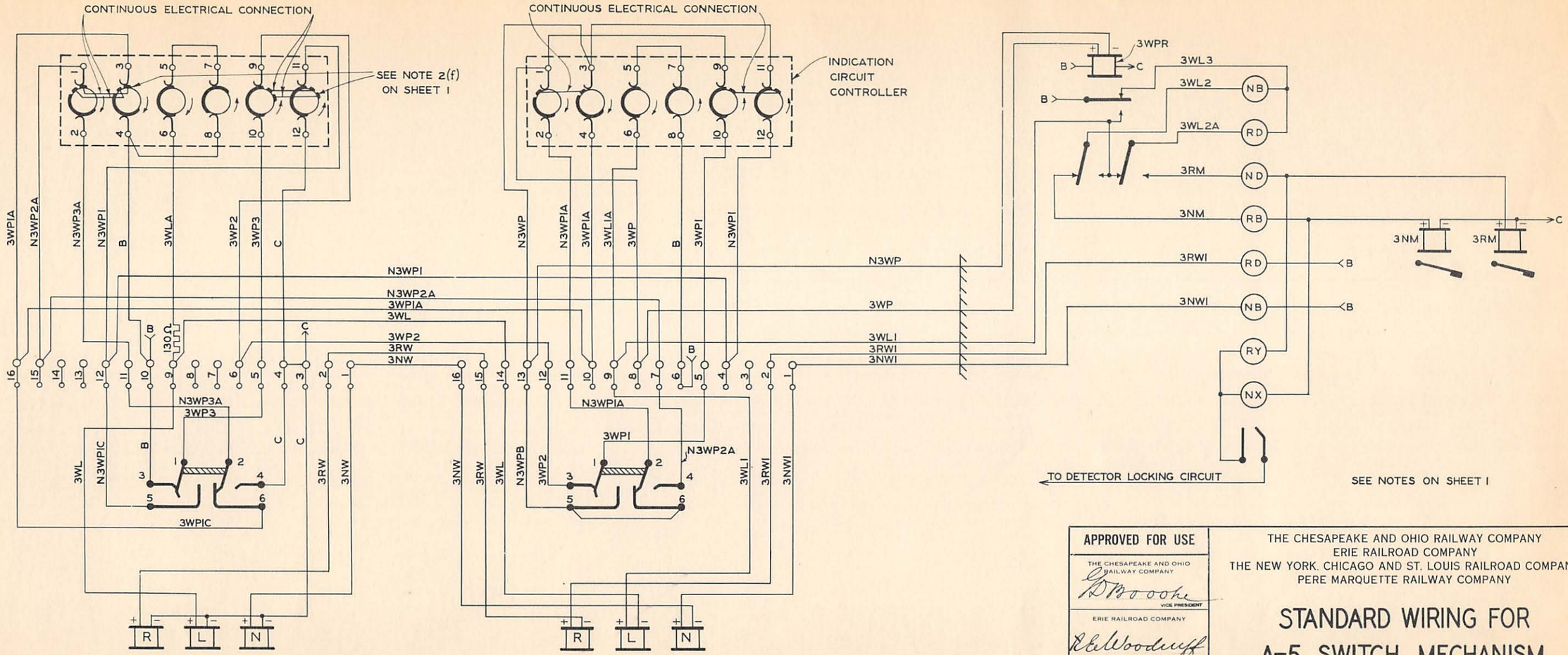
STANDARD WIRING FOR A-5 SWITCH MECHANISM WITH CP VALVE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: OCT. 16, 1934.
CHIEF ENGINEER

SHEET 1 OF 2

S-2510



S-2510-2 WIRING FOR CROSSOVER OR SINGLE SWITCH AND DERAIL

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT

ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

K.L.M. K.L.M. C.D.M. A.J.P.

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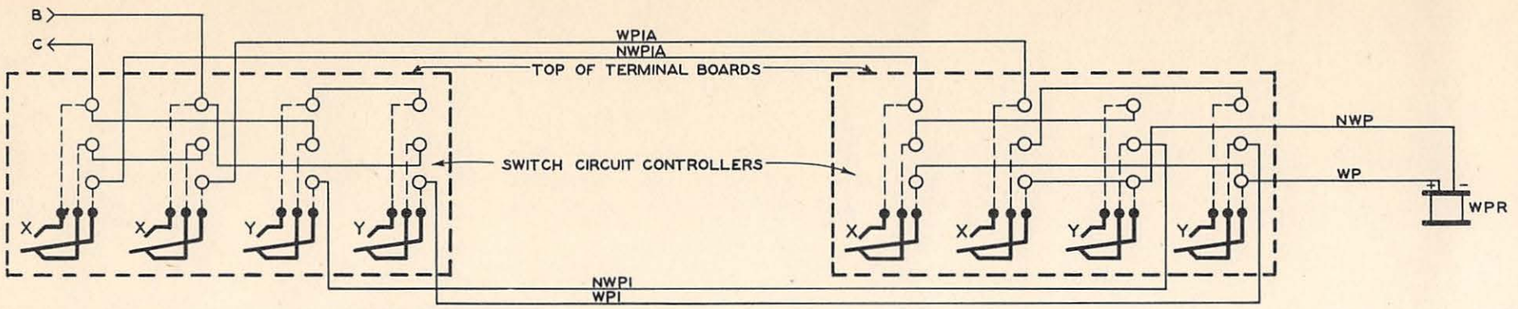
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD WIRING FOR A-5 SWITCH MECHANISM WITH CP VALVE

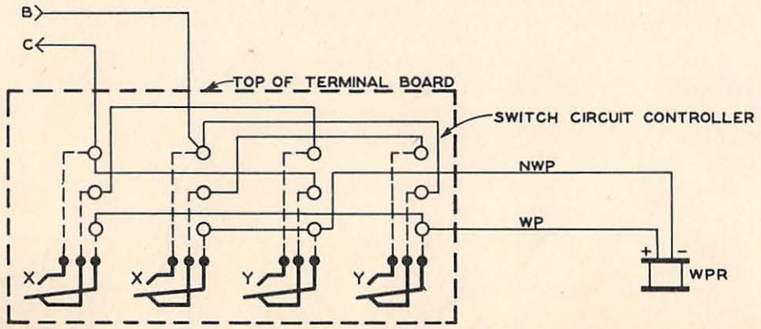
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: OCT. 16, 1934.
CHIEF ENGINEER

SHEET 2 OF 2

S-2510



S-2520-1 WP CIRCUIT FOR CROSSOVER OR SWITCH AND DERAIL



S-2520-2 WP CIRCUIT FOR SINGLE SWITCH OR DERAIL

NOTES

1. ADJUSTMENT OF CONTACTS SHALL BE AS FOLLOWS:
   (a) CONTACTS "X" AND "Y" SHALL BE NORMALLY CLOSED AS SHOWN WHEN SWITCH POINTS ARE LESS THAN $\frac{1}{4}$ INCH FROM FULL NORMAL TO FULL NORMAL POSITION.
   (b) CONTACTS "Y" SHALL BE CLOSED IN THE OPPOSITE POSITION WHEN SWITCH POINTS ARE $\frac{1}{4}$ INCH OR MORE FROM FULL NORMAL POSITION.
   (c) CONTACTS "X" SHALL BE CLOSED IN OPPOSITE POSITION WHEN SWITCH POINTS ARE LESS THAN $\frac{1}{4}$ INCH FROM FULL REVERSE TO FULL REVERSE POSITION.

CIRCUIT FOR USE WHEN TYPE U-3 AND U-5 SWITCH CIRCUIT CONTROLLERS ARE LOCATED ON OPEN POINT SIDE OF SWITCH.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Brooke
VICE PRESIDENT

ERIE RAILROAD COMPANY
R E Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Brooke
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
R H Bowman
VICE PRESIDENT

C.H.W. C.H.W. | C.D.M. | A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

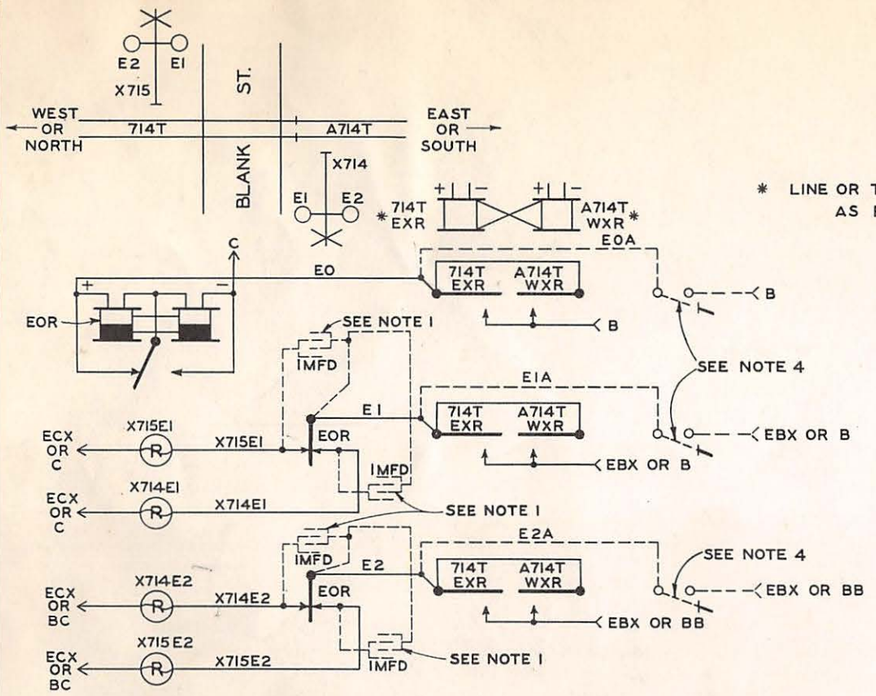
STANDARD

WP CIRCUITS USING SWITCH CIRCUIT CONTROLLERS

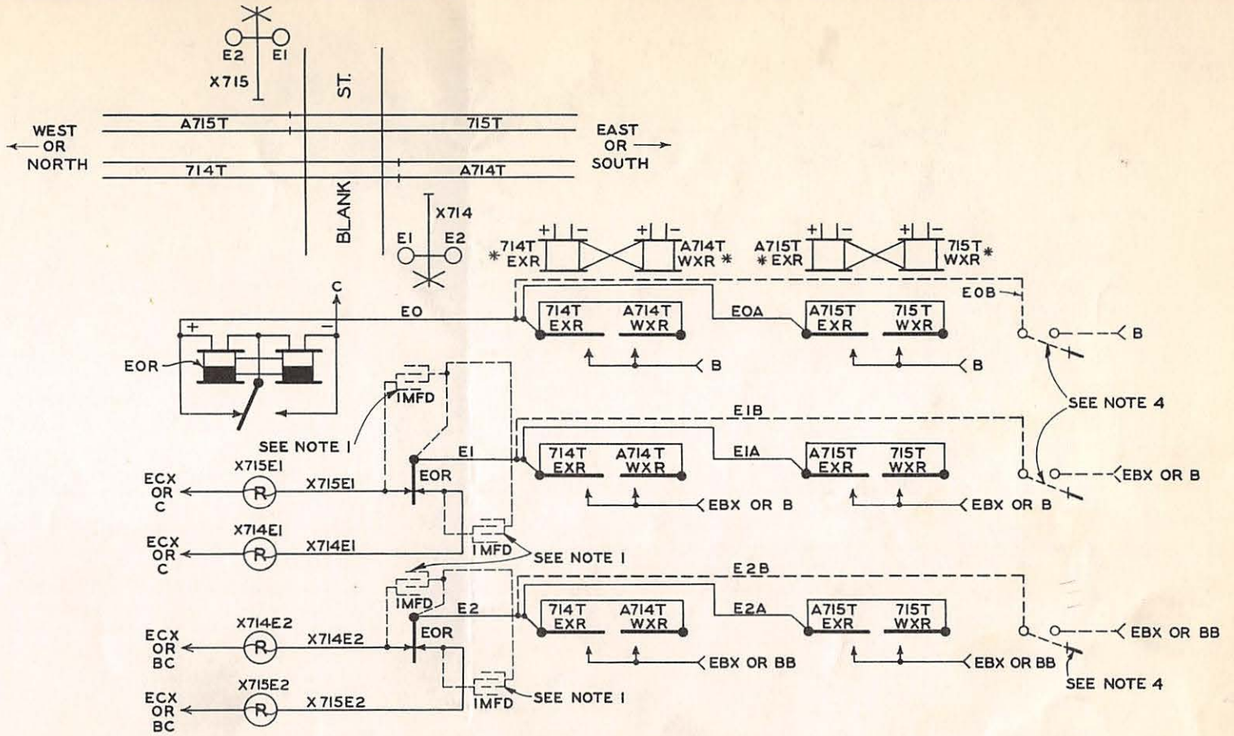
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: W Wisehel CHIEF ENGINEER OCT. 7, 1935.

SHEET 1 OF 2

S-2520



S-2530-1 FLASHER CIRCUIT
USING INTERLOCKING RELAY
SINGLE TRACK



S-2530-2 FLASHER CIRCUIT
USING INTERLOCKING RELAYS
MULTIPLE TRACK

NOTES

1. ADD 0086 MANSBRIDGE TYPE CONDENSERS OR EQUAL ON LIGHT CONTACTS AS REQUIRED.
2. AT LEAST TWO RETURN WIRES SHALL BE PROVIDED FOR THE LIGHTS ON EACH MAST.
3. TRACK CIRCUIT NUMBERING SHOWN APPLIES ONLY IN NONSIGNALED TERRITORY.
4. TEST SWITCHES, WHERE USED, MAY BE TRIPLE POLE, SINGLE THROW, KNIFE SWITCHES OR OTHER SUITABLE DEVICE SO ARRANGED THAT DOOR OF TEST BOX CANNOT BE CLOSED UNLESS CIRCUIT IS OPEN.
5. WHERE PRIMARY BATTERY IS USED EXCLUSIVELY, TWO SETS OF BATTERIES SHALL BE USED AND CONNECTED IN MULTIPLE. THE FIRST BATTERY SHALL BE DESIGNATED BY B AND C, THE SECOND BATTERY BY BB AND BC.
6. FOR TYPICAL BATTERY CHARGING AND POWER TRANSFER CIRCUITS SEE LATEST REVISION OF STANDARD DRAWING S-2535, TYPICAL POWER TRANSFER AND BATTERY CHARGING CIRCUITS.

APPARATUS
XR= DX-13 OR EQUAL
EOR= NF-2 " "

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

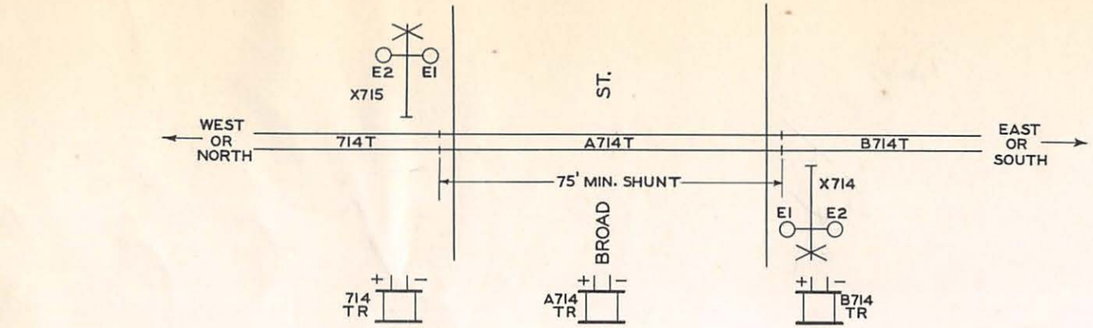
K.L.M.	W.S.E.	C.A.T.
K.L.M.		

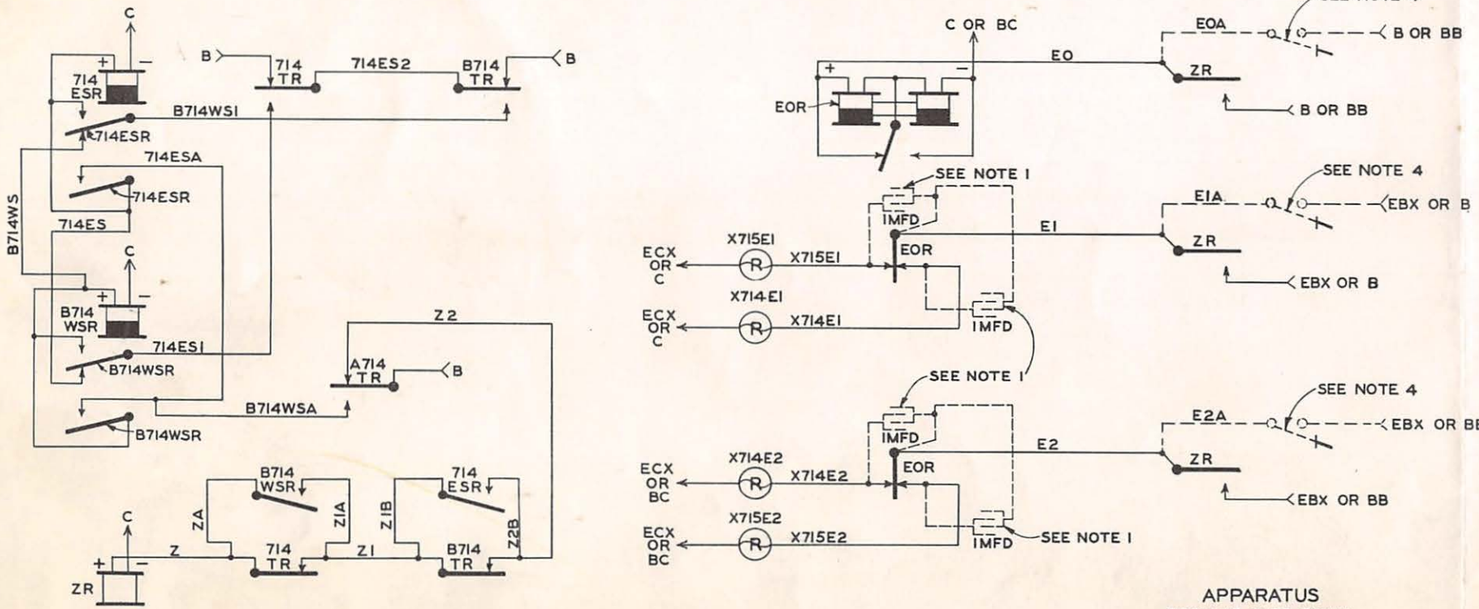
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD TYPICAL HIGHWAY CROSSING SIGNAL CIRCUITS
MAKE AND BREAK TYPE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
CHAIRMAN
NOV. 25, 1940

SHEET 1 OF 5
S-2530-B





S-2530-3 FLASHER CIRCUIT
USING STICK RELAYS

APPARATUS
EOR = NF-2 OR EQUAL
TR = DN-11 " "
SR = " " "
ZR = " " "

NOTES

1. ADD 0086 MANSBRIDGE TYPE CONDENSERS OR EQUAL ON LIGHT CONTACTS AS REQUIRED.
2. AT LEAST TWO RETURN WIRES SHALL BE PROVIDED FOR THE LIGHTS ON EACH MAST.
3. TRACK CIRCUIT NUMBERING SHOWN APPLIES ONLY IN NONSIGNALED TERRITORY.
4. TEST SWITCHES, WHERE USED, MAY BE TRIPLE POLE, SINGLE THROW, KNIFE SWITCHES OR OTHER SUITABLE DEVICE SO ARRANGED THAT DOOR OF TEST BOX CANNOT BE CLOSED UNLESS CIRCUIT IS OPEN.
5. WHERE PRIMARY BATTERY IS USED EXCLUSIVELY, TWO SETS OF BATTERIES SHALL BE USED AND CONNECTED IN MULTIPLE. THE FIRST BATTERY SHALL BE DESIGNATED BY B AND C, THE SECOND BATTERY BY BB AND BC.
6. FOR TYPICAL BATTERY CHARGING AND POWER TRANSFER CIRCUITS SEE LATEST REVISION OF STANDARD DRAWING S-2535, TYPICAL POWER TRANSFER AND BATTERY CHARGING CIRCUITS.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PRESIDENT

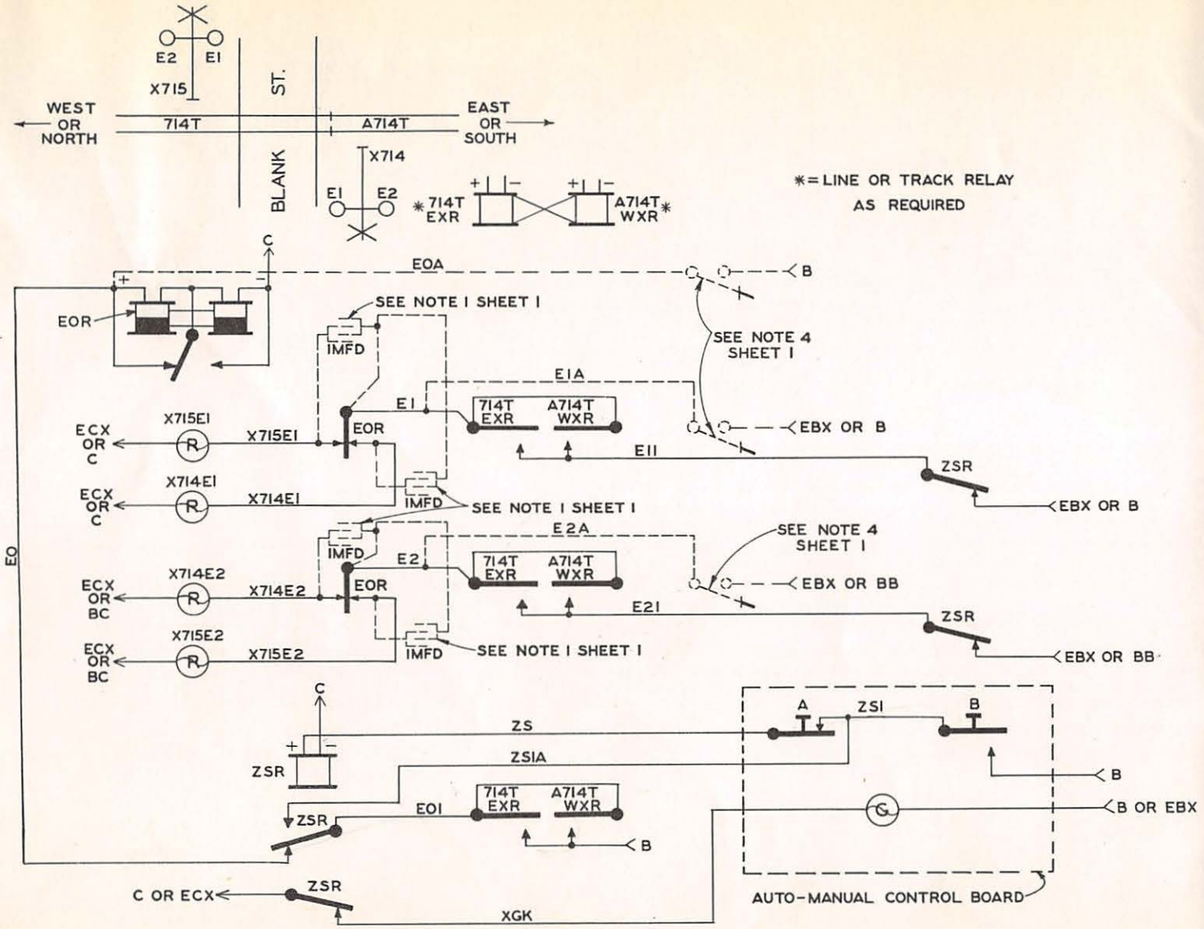
PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

K.L.M. K.L.M. | W.S.E. | C.A.T.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD TYPICAL HIGHWAY CROSSING SIGNAL CIRCUITS
MAKE AND BREAK TYPE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
NOV. 25, 1940
CHAIRMAN



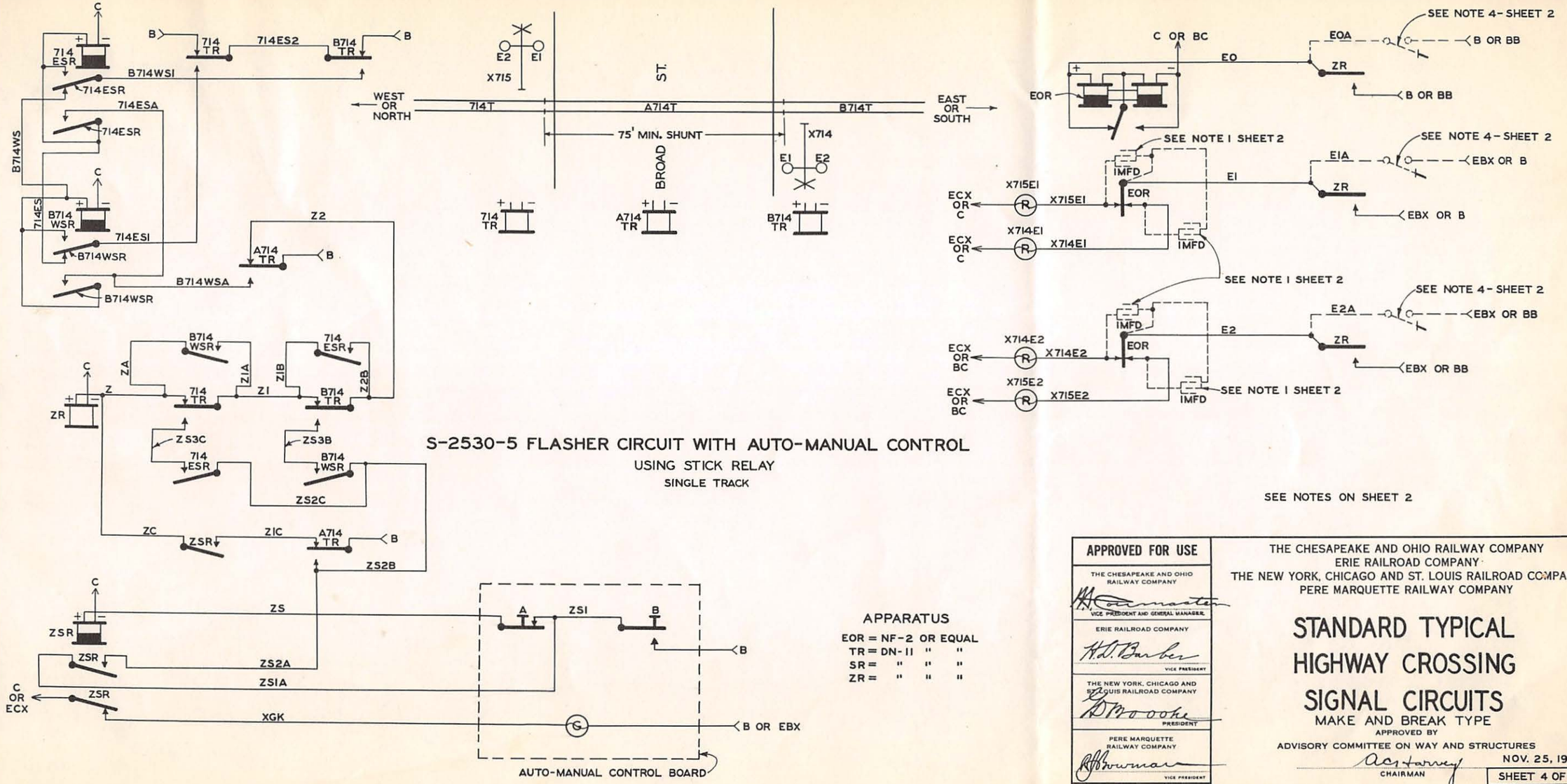
S-2530-4 FLASHER CIRCUIT WITH AUTO-MANUAL CONTROL

USING INTERLOCKING RELAY
SINGLE TRACK

APPARATUS
EOR = NF-2 OR EQUAL
XR = DX-13 " "
ZSR = DN-11 " "

SEE NOTES ON SHEET 1

APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY VICE PRESIDENT AND GENERAL MANAGER	THE CHESAPEAKE AND OHIO RAILWAY COMPANY ERIE RAILROAD COMPANY THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY PERE MARQUETTE RAILWAY COMPANY
ERIE RAILROAD COMPANY VICE PRESIDENT	STANDARD TYPICAL HIGHWAY CROSSING SIGNAL CIRCUITS MAKE AND BREAK TYPE
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY PRESIDENT	APPROVED BY ADVISORY COMMITTEE ON WAY AND STRUCTURES CHAIRMAN NOV. 25, 1940
PERE MARQUETTE RAILWAY COMPANY VICE PRESIDENT	SHEET 3 OF 5 S-2530-B
K.L.M. K.L.M.	W.S.E. C.A.T.



S-2530-5 FLASHER CIRCUIT WITH AUTO-MANUAL CONTROL

USING STICK RELAY

SINGLE TRACK

SEE NOTES ON SHEET 2

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

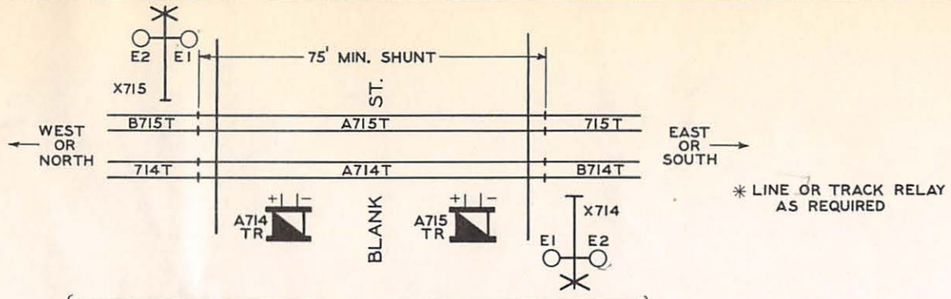
K.L.M. K.L.M. | W.S.E. | C.A.T.

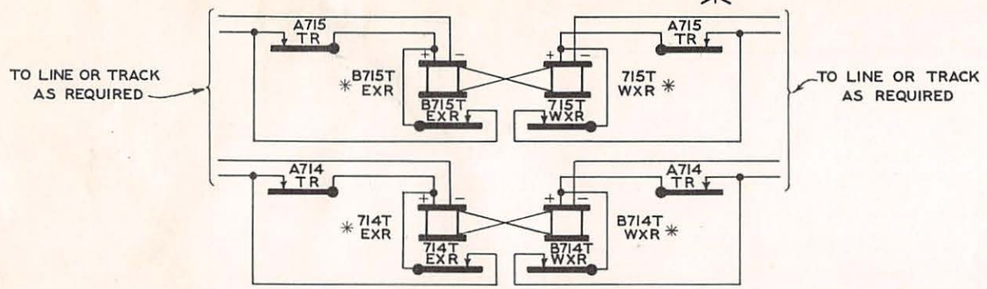
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

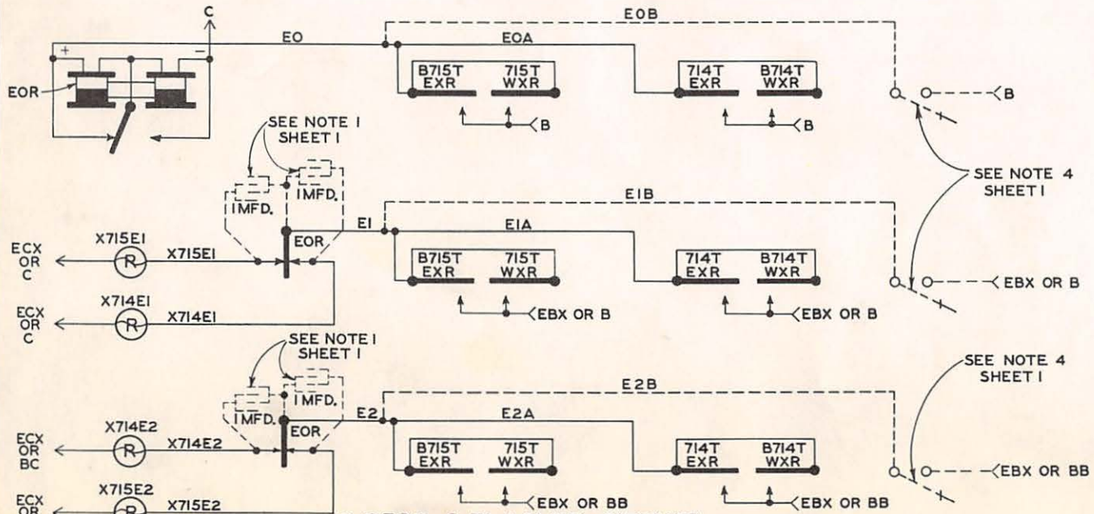
STANDARD TYPICAL HIGHWAY CROSSING SIGNAL CIRCUITS

MAKE AND BREAK TYPE

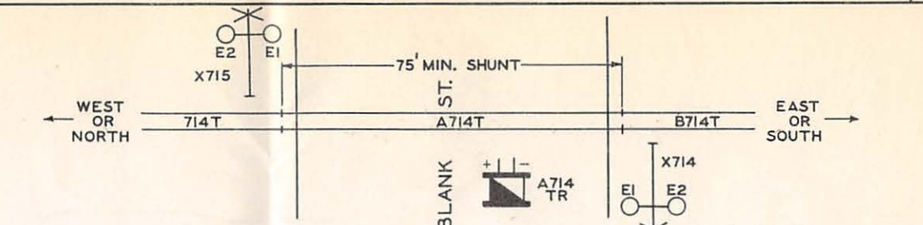
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
CHAIRMAN
NOV. 25, 1940

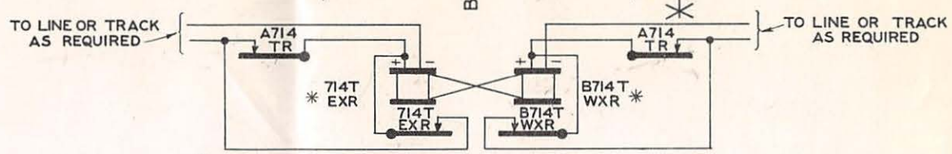


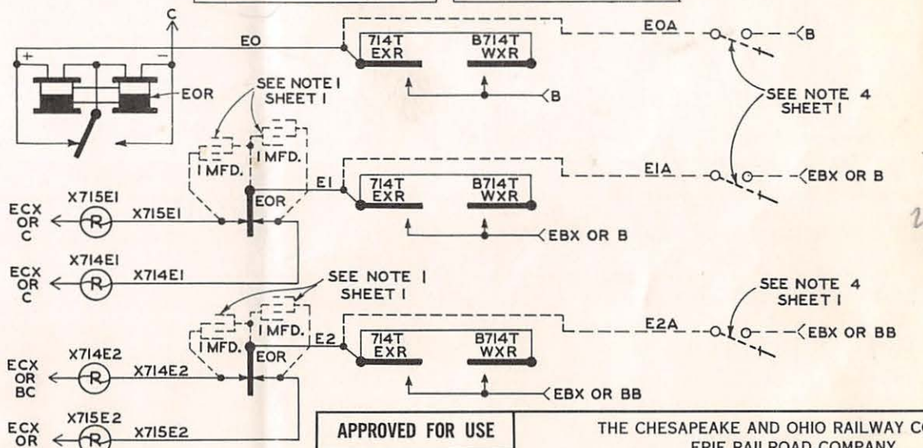




S-2530-6 FLASHER CIRCUIT
USING INTERLOCKING RELAYS WITH NEUTRAL CENTER TRACK SECTIONS – MULTIPLE TRACK







S-2530-7 FLASHER CIRCUIT
USING INTERLOCKING RELAY WITH NEUTRAL CENTER TRACK SECTION
SINGLE TRACK

APPARATUS
XR = DX-13 OR EQUAL
EOR = NF-2 " "
TR = DN-11 " "

SEE NOTES ON SHEET 1

Young 2,186,794

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

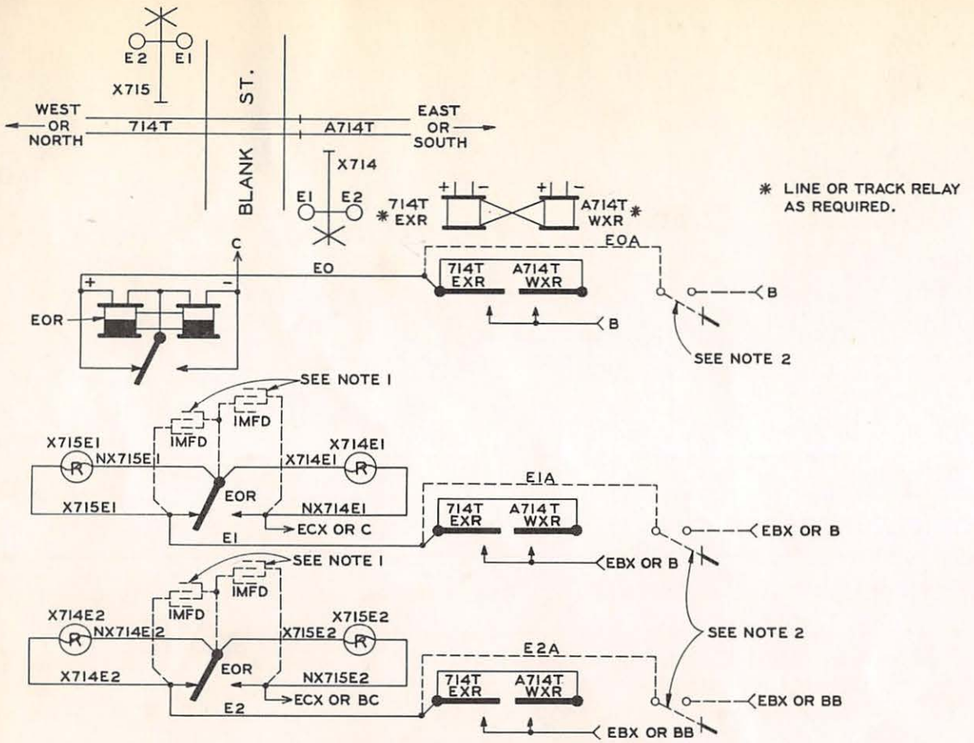
C.H.W. K.L.M.	W.S.E.	C.A.T.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

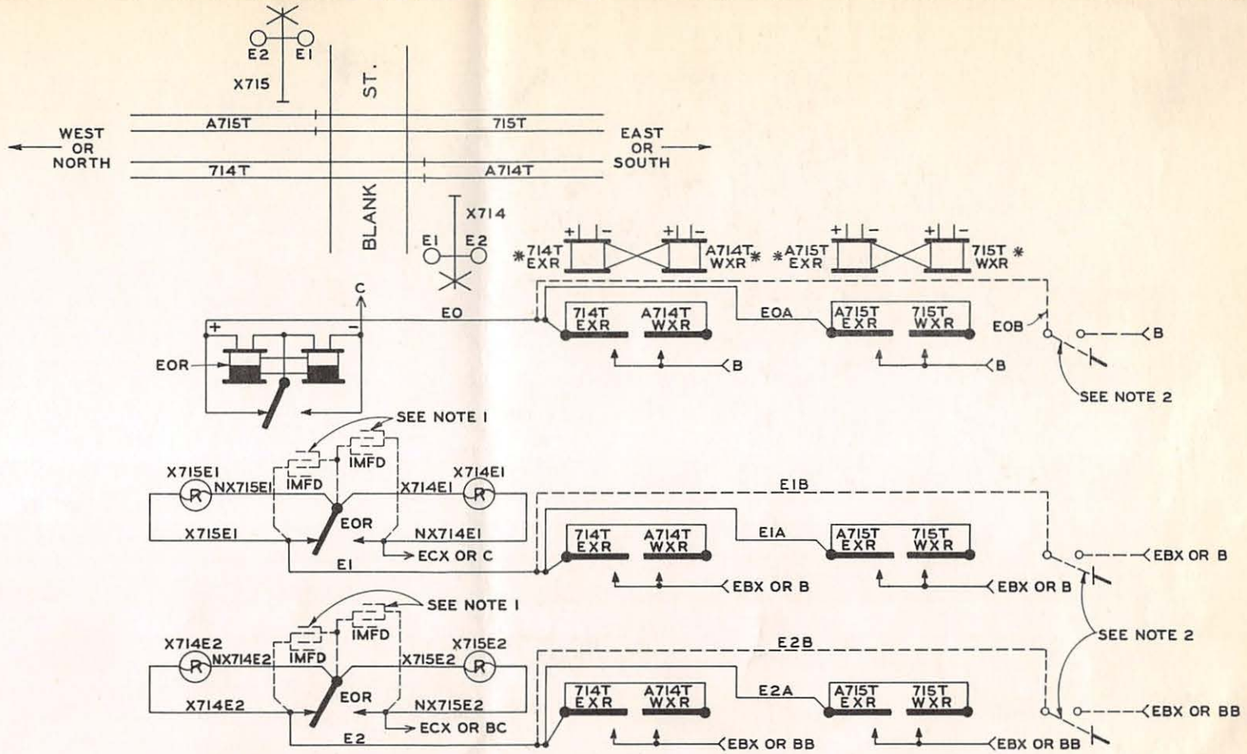
STANDARD TYPICAL HIGHWAY CROSSING SIGNAL CIRCUITS

MAKE AND BREAK TYPE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
NOV. 25, 1940
CHAIRMAN



S-2531-1 FLASHER CIRCUIT
USING INTERLOCKING RELAY
SINGLE TRACK



S-2531-2 FLASHER CIRCUIT
USING INTERLOCKING RELAY
MULTIPLE TRACK

NOTES

1. ADD 0086 MANSBRIDGE TYPE CONDENSERS OR EQUAL ON LIGHT CONTACTS AS REQUIRED.
2. TEST SWITCHES, WHERE USED, MAY BE TRIPLE POLE, SINGLE THROW, KNIFE SWITCHES OR OTHER SUITABLE DEVICE SO ARRANGED THAT DOOR OF TEST BOX CANNOT BE CLOSED UNLESS CIRCUIT IS OPEN.
3. TRACK CIRCUIT NUMBERING SHOWN APPLIES ONLY IN NONSIGNALED TERRITORY.
4. WHERE PRIMARY BATTERY IS USED EXCLUSIVELY, TWO SETS OF BATTERIES SHALL BE USED AND CONNECTED IN MULTIPLE. THE FIRST BATTERY SHALL BE DESIGNATED BY B AND C, THE SECOND BATTERY BY BB AND BC.
5. FOR TYPICAL BATTERY CHARGING AND POWER TRANSFER CIRCUITS SEE LATEST REVISION OF STANDARD DRAWING S-2535, TYPICAL POWER TRANSFER AND BATTERY CHARGING CIRCUITS.

APPARATUS
XR = DX-13 OR EQUAL
EOR = FN-16 " "

APPROVED FOR USE

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VICE PRESIDENT

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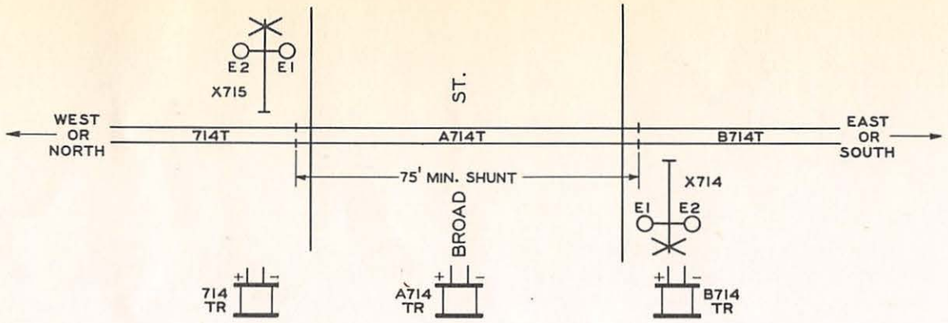
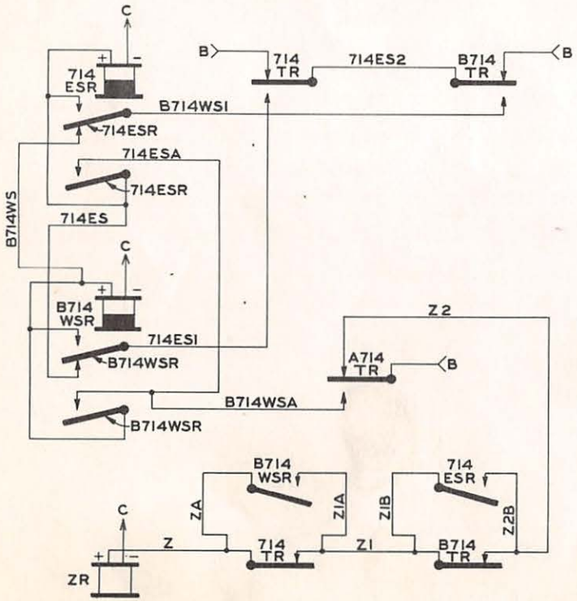
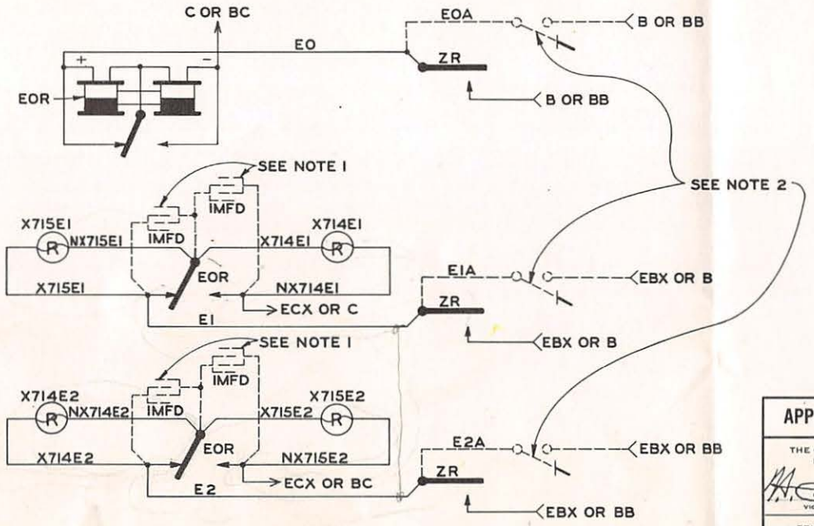
STANDARD TYPICAL HIGHWAY CROSSING SIGNAL CIRCUITS

SHUNT TYPE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
NOV. 25, 1940
CHAIRMAN







S-2531-3 FLASHER CIRCUIT
USING STICK RELAYS

APPARATUS
EOR = FN-16 OR EQUAL
TR = DN-11 " "
SR = " " "
ZR = " " "

NOTES
1. ADD 0086 MANSBRIDGE TYPE CONDENSERS OR EQUAL ON LIGHT CONTACTS AS REQUIRED.
2. TEST SWITCHES, WHERE USED, MAY BE TRIPLE POLE, SINGLE THROW, KNIFE SWITCHES OR OTHER SUITABLE DEVICE SO ARRANGED THAT DOOR OF TEST BOX CANNOT BE CLOSED UNLESS CIRCUIT IS OPEN.
3. TRACK CIRCUIT NUMBERING SHOWN APPLIES ONLY IN NONSIGNALED TERRITORY.
4. WHERE PRIMARY BATTERY IS USED EXCLUSIVELY, TWO SETS OF BATTERIES SHALL BE USED AND CONNECTED IN MULTIPLE. THE FIRST BATTERY SHALL BE DESIGNATED BY B AND C, THE SECOND BATTERY BY BB AND BC.
5. FOR TYPICAL BATTERY CHARGING AND POWER TRANSFER CIRCUITS SEE LATEST REVISION OF STANDARD DRAWING S-2535, TYPICAL POWER TRANSFER AND BATTERY CHARGING CIRCUITS.

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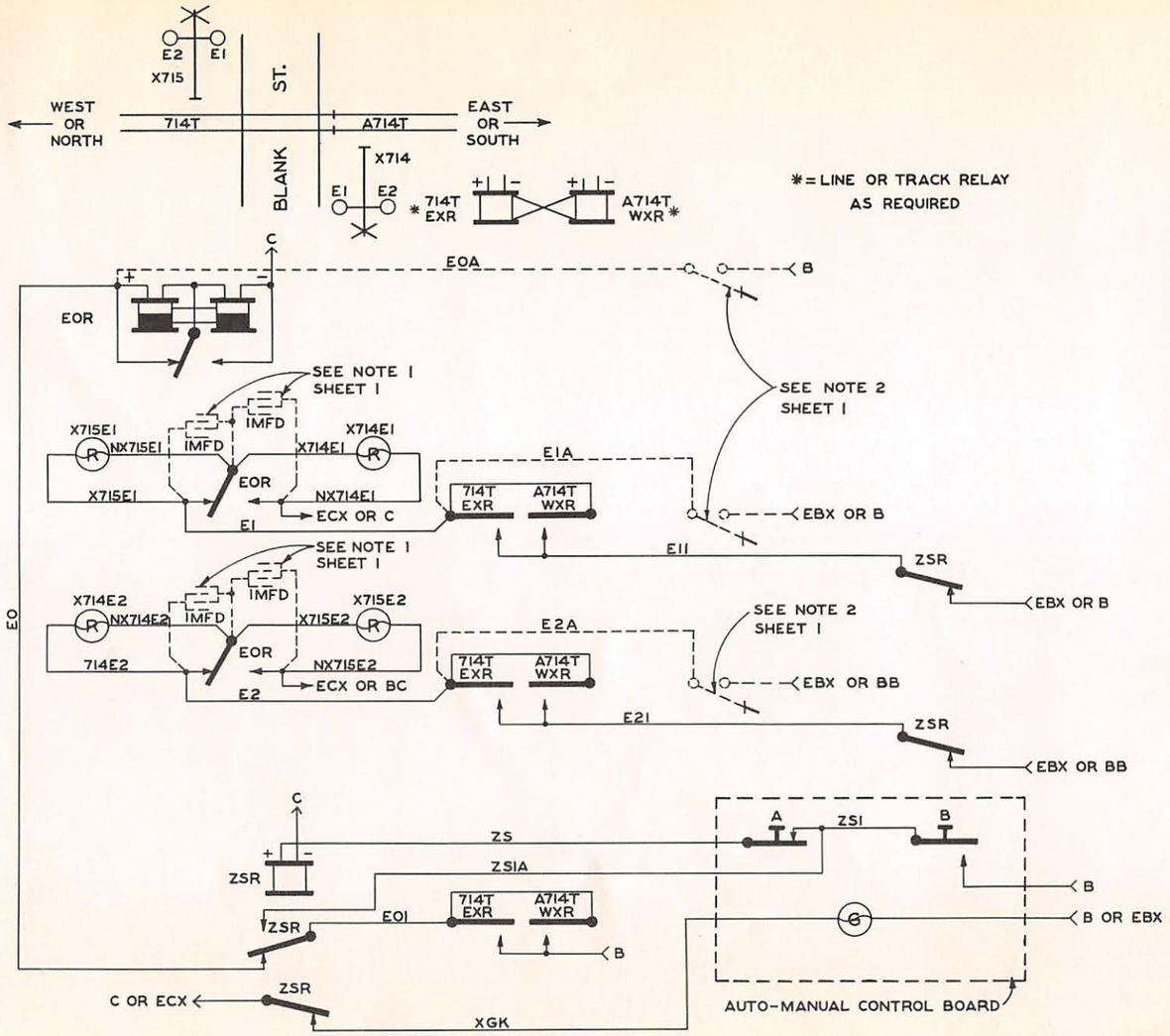
STANDARD TYPICAL HIGHWAY CROSSING SIGNAL CIRCUITS
SHUNT TYPE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
A.C. Harvey
CHAIRMAN
NOV. 25, 1940



S-2531-4 FLASHER CIRCUIT WITH AUTO-MANUAL CONTROL
USING INTERLOCKING RELAY
SINGLE TRACK

APPARATUS
E0R = FN-16 OR EQUAL
XR = DX-13 " "
ZSR = DN-11 " "

SEE NOTES ON SHEET 1

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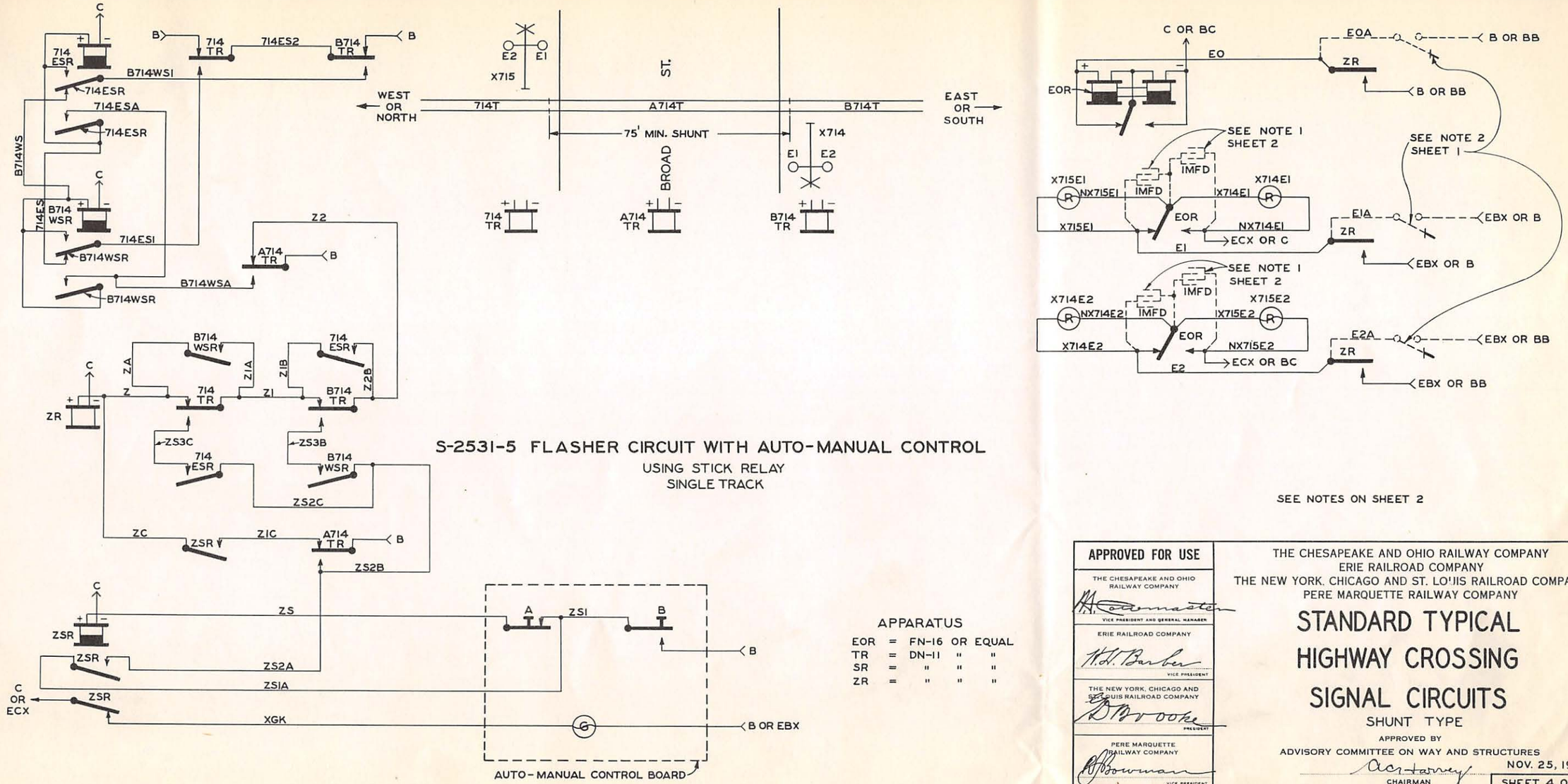
STANDARD TYPICAL HIGHWAY CROSSING SIGNAL CIRCUITS

SHUNT TYPE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
CHAIRMAN
NOV. 25, 1940



S-2531-5 FLASHER CIRCUIT WITH AUTO-MANUAL CONTROL

USING STICK RELAY
SINGLE TRACK

APPARATUS

EOR	=	FN-16	OR	EQUAL
TR	=	DN-11	"	"
SR	=	"	"	"
ZR	=	"	"	"

SEE NOTES ON SHEET 2

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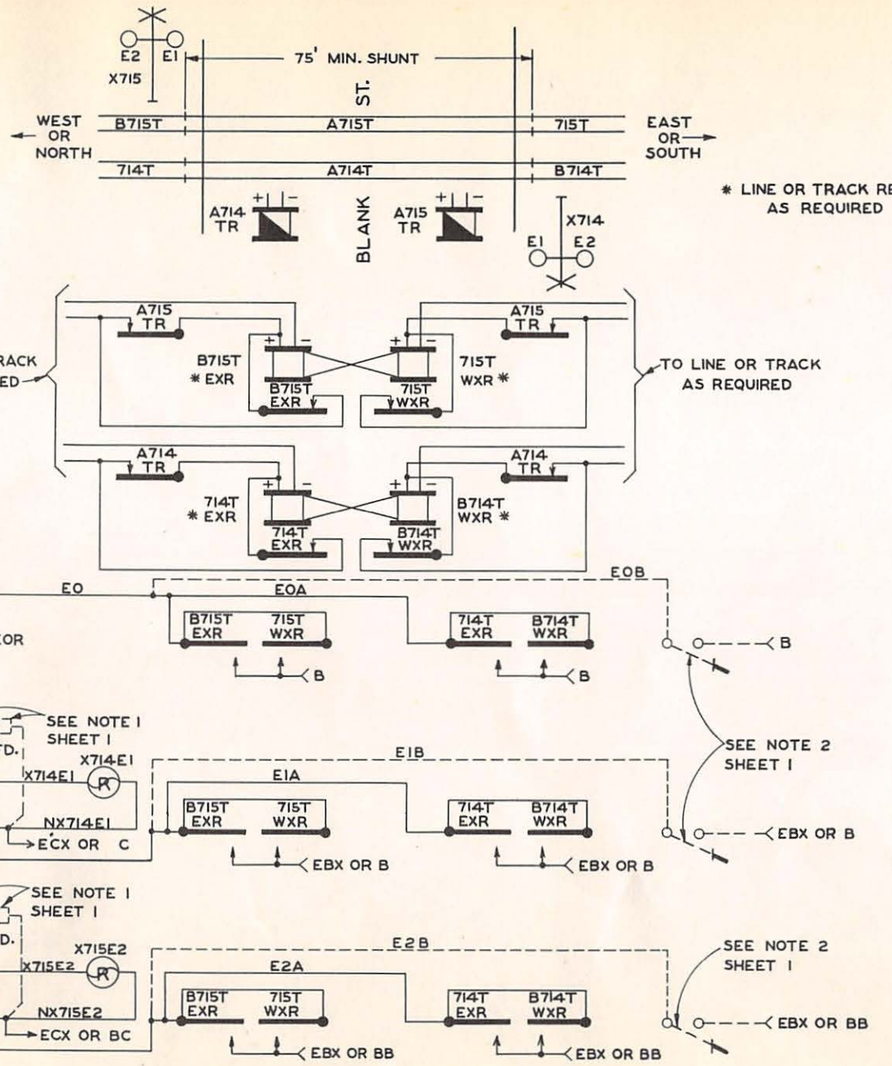
STANDARD TYPICAL HIGHWAY CROSSING SIGNAL CIRCUITS

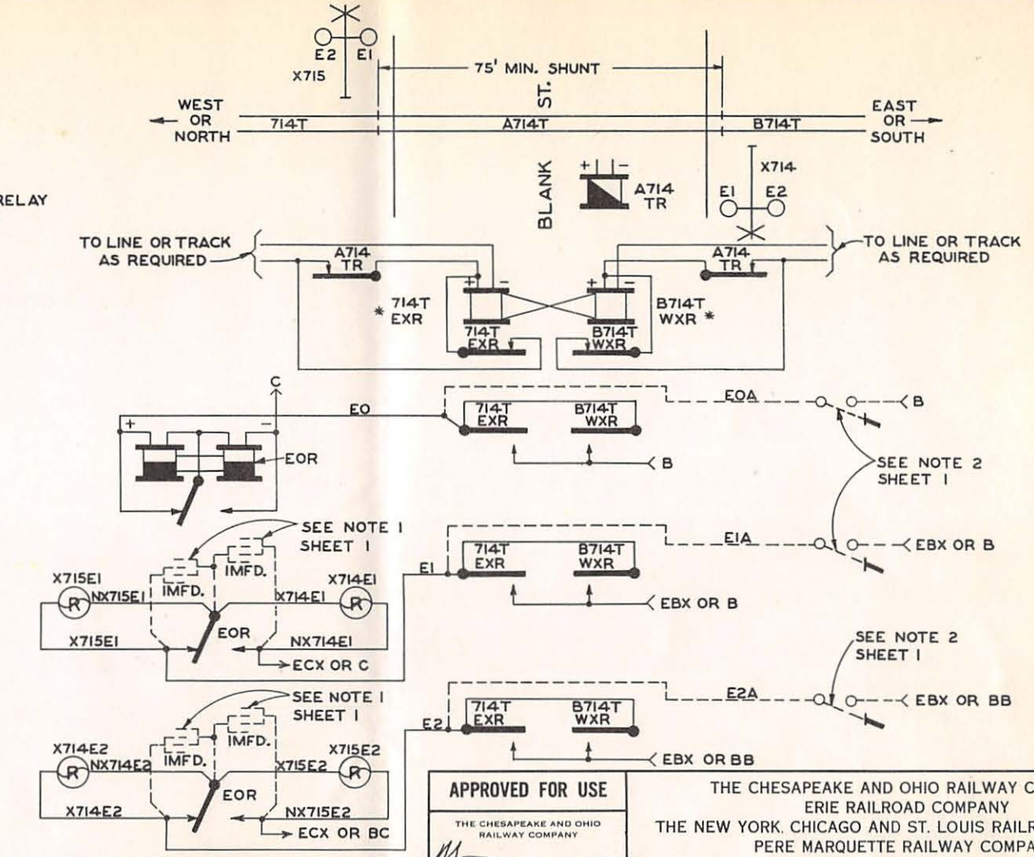
SHUNT TYPE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
NOV. 25, 1940
CHAIRMAN



S-2531-6 FLASHER CIRCUIT

USING INTERLOCKING RELAYS WITH NEUTRAL CENTER TRACK SECTIONS – MULTIPLE TRACK



S-2531-7 FLASHER CIRCUIT

USING INTERLOCKING RELAY WITH NEUTRAL CENTER TRACK SECTION

SINGLE TRACK

APPARATUS

XR = DX-13 OR EQUAL
EOR = FN-16 " "
TR = DN-11 " "

SEE NOTES ON SHEET 1

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STANDARD TYPICAL HIGHWAY CROSSING SIGNAL CIRCUITS

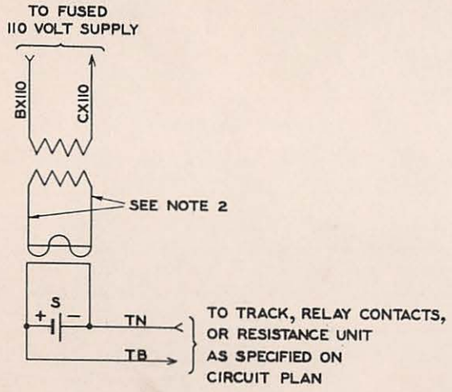
SHUNT TYPE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

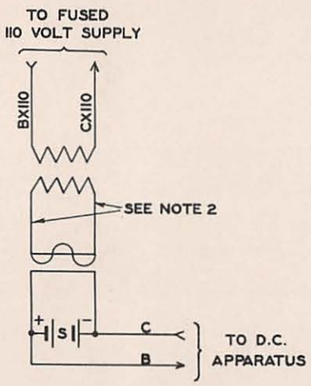
NOV. 25, 1940

CHAIRMAN

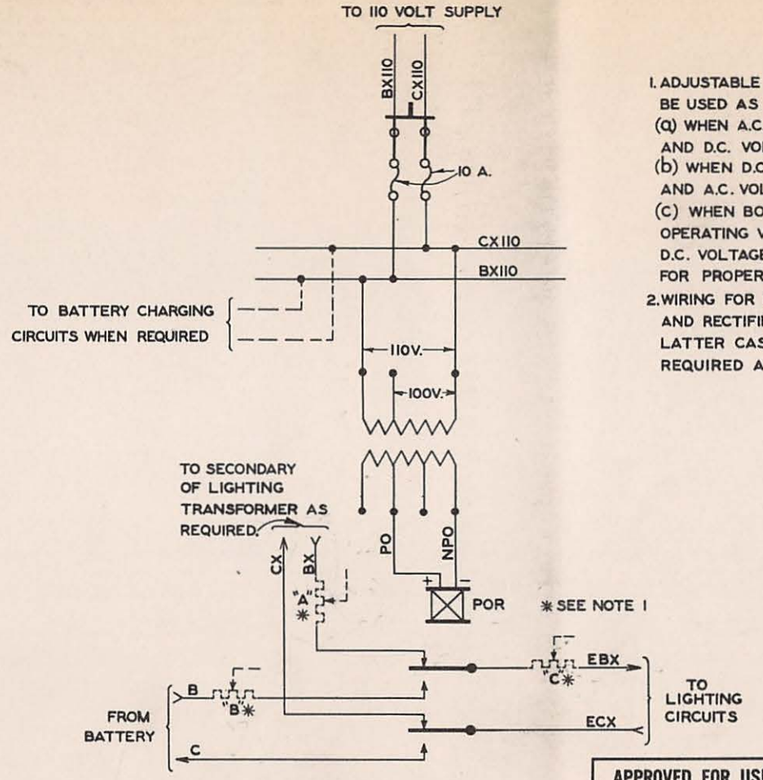
SHEET 5 OF 5
S-2531-A



S-2535-1 TRACK BATTERY CHARGING CIRCUIT



S-2535-2 LOW VOLTAGE BATTERY CHARGING CIRCUIT



S-2535-3 POWER TRANSFER CIRCUIT

NOTES

1. ADJUSTABLE RESISTORS AT A, B, AND C IN CIRCUIT S-2535-3 SHALL BE USED AS REQUIRED:
   (a) WHEN A.C. VOLTAGE AT LAMP EXCEEDS MAXIMUM OPERATING VOLTAGE AND D.C. VOLTAGE IS NOT EXCESSIVE, PLACE RESISTOR AT "A".
   (b) WHEN D.C. VOLTAGE AT LAMP EXCEEDS MAXIMUM OPERATING VOLTAGE AND A.C. VOLTAGE IS NOT EXCESSIVE, PLACE RESISTOR AT "B".
   (c) WHEN BOTH A.C. AND D.C. VOLTAGE AT LAMP EXCEEDS MAXIMUM OPERATING VOLTAGE, PLACE RESISTOR AT "C" AND ADJUST FOR PROPER D.C. VOLTAGE AT LAMP. PLACE ADDITIONAL RESISTOR AT "A" AND ADJUST FOR PROPER A.C. VOLTAGE.
2. WIRING FOR BATTERY CHARGING CIRCUITS IS FOR COMBINED TRANSFORMER AND RECTIFIER OR INDIVIDUAL TRANSFORMER AND RECTIFIER. IN THE LATTER CASE, THE VOLTAGE SUPPLIED THE RECTIFIER SHALL BE AS REQUIRED AND WIRE TAGGING SHALL DESIGNATE THE VOLTAGE.

APPROVED FOR USE

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K.L.M.		

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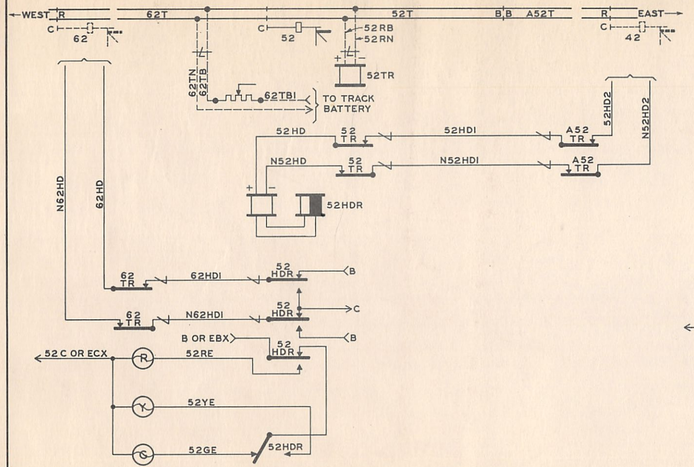
STANDARD TYPICAL POWER TRANSFER AND BATTERY CHARGING CIRCUITS

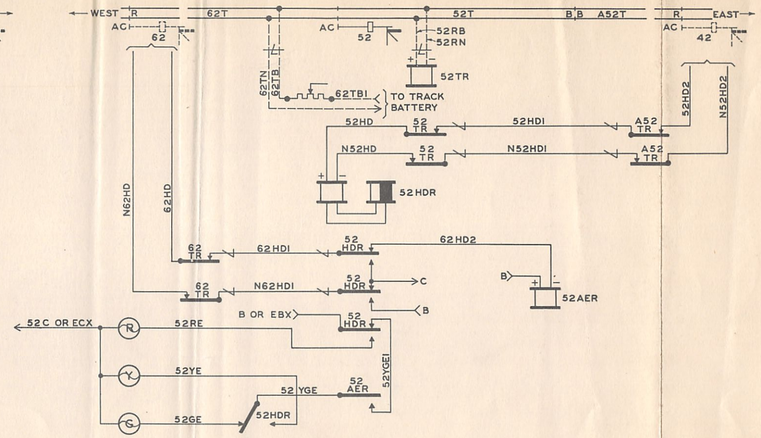
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E W Kuchel CHIEF ENGINEER JUNE 19, 1934

S-2535



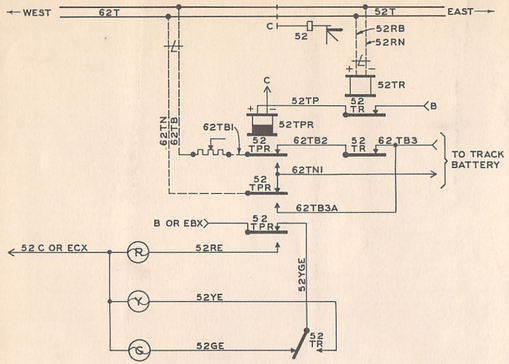
S-2540-1 POLARIZED LINE CONTROL
CONTINUOUS LIGHTING

APPARATUS
HDR= DP-21 OR EQUAL
TR = DN-11 " "



S-2540-2 POLARIZED LINE CONTROL
APPROACH LIGHTING

APPARATUS
HDR= DP-21 OR EQUAL
TR = DN-11 " "
AER= DN-22 " "



S-2540-3 POLARIZED TRACK CONTROL
WITH SLOW RELEASE RELAY
CONTINUOUS LIGHTING

APPARATUS
TR = DP-14 OR EQUAL
TPR=DN-11 " "

NOTE
FOR TYPICAL POWER TRANSFER, LINE AND TRACK BATTERY CHARGING CIRCUITS, AND APPLICATION OF RESISTANCE UNITS FOR ADJUSTING VOLTAGE AT LAMPS, SEE LATEST REVISION OF STANDARD DRAWING S-2535.

APPROVED FOR USE

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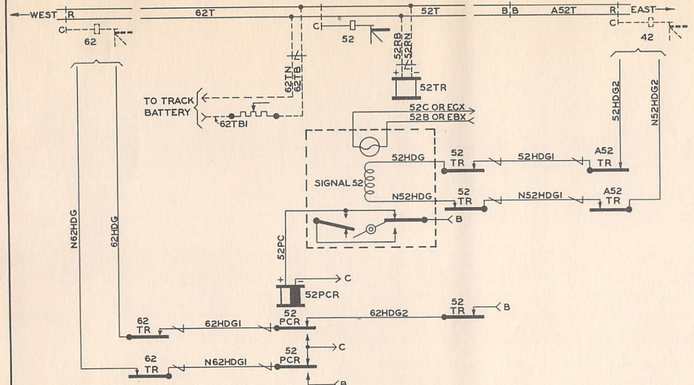
STANDARD

TYPICAL CIRCUITS FOR 2 BLOCK 3 INDICATION AUTOMATIC COLOR LIGHT SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 18, 1935
CHIEF ENGINEER

S-2540



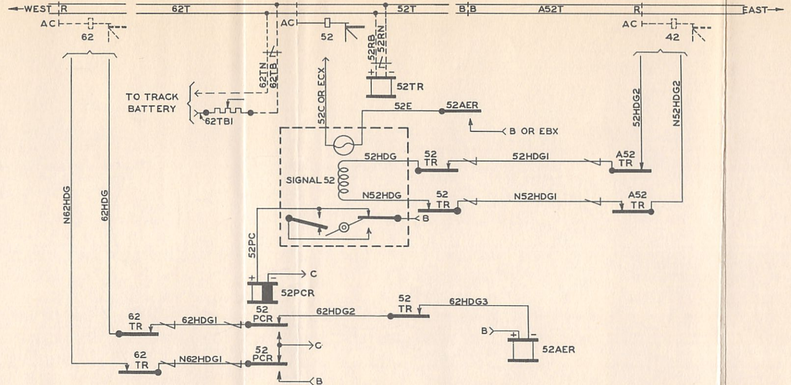
S-2541-1 POLARIZED LINE CONTROL

CONTINUOUS LIGHTING

APPARATUS

TR=DN-11 OR EQUAL

PCR=DN-18 " "



S-2541-2 POLARIZED LINE CONTROL

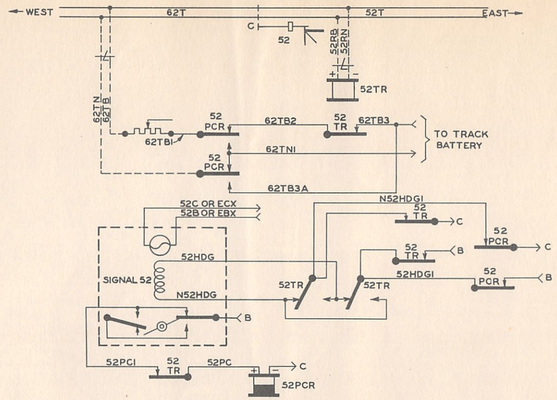
APPROACH LIGHTING

APPARATUS

TR=DN-11 OR EQUAL

PCR=DN-18 " "

AER=DN-22 " "



S-2541-3 POLARIZED TRACK CONTROL

CONTINUOUS LIGHTING

APPARATUS

TR=DP-14 OR EQUAL

PCR=DN-11 " "

NOTES

1. FOR TYPICAL POWER TRANSFER, LINE AND TRACK BATTERY CHARGING CIRCUITS, AND APPLICATION OF RESISTANCE UNITS FOR ADJUSTING VOLTAGE AT LAMPS, SEE LATEST REVISION OF STANDARD DRAWING S-2535.
2. FOR MECHANISM WIRING OF SEARCHLIGHT SIGNALS SEE LATEST REVISION OF STANDARD DRAWING S-2542.

APPROVED FOR USE

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C.H.W.

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PERE MARQUETTE RAILWAY COMPANY

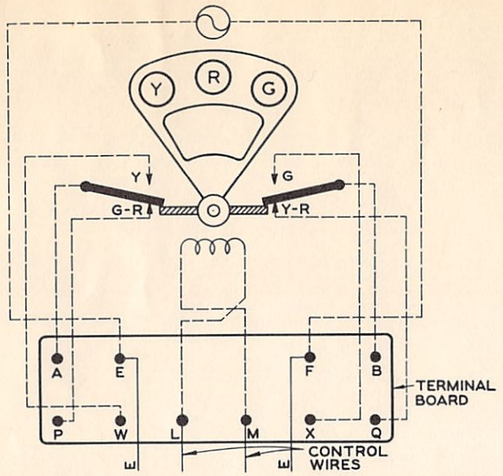
STANDARD

TYPICAL CIRCUITS FOR 2 BLOCK 3 INDICATION AUTOMATIC SEARCHLIGHT SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

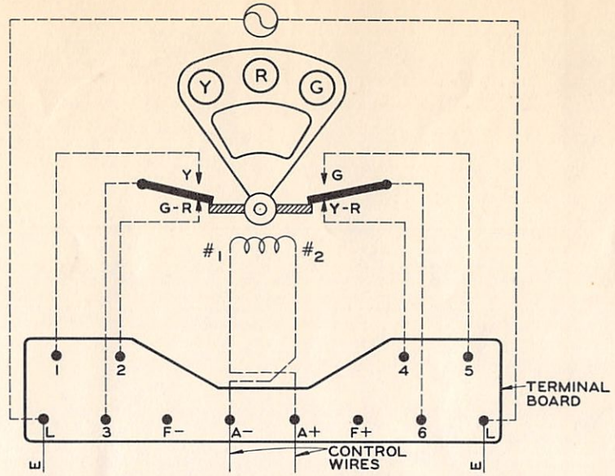
APPROVED: ..... JUNE 18, 1935
CHIEF ENGINEER

S-2541



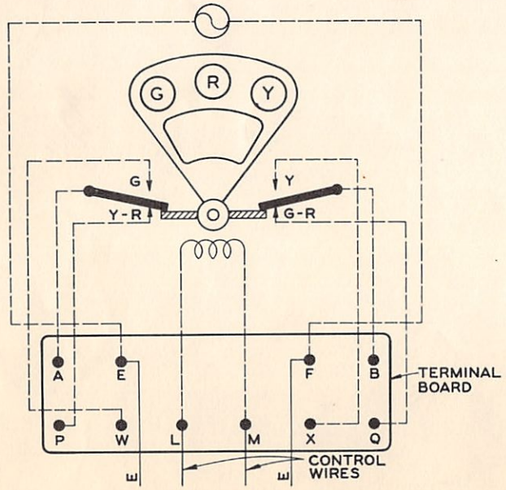
S-2542-1 WIRING FOR G.R.S. CO. SIGNAL

YELLOW TO LEFT - GREEN TO RIGHT



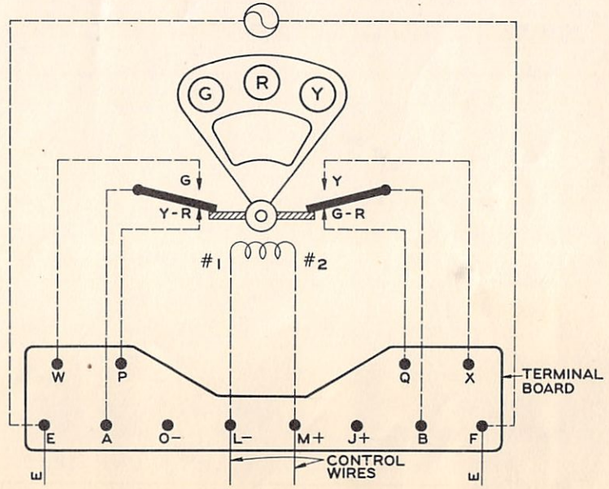
S-2542-2 WIRING FOR U.S.& S. CO. SIGNAL

YELLOW TO LEFT - GREEN TO RIGHT



S-2542-3 WIRING FOR G.R.S. CO. SIGNAL

GREEN TO LEFT - YELLOW TO RIGHT



S-2542-4 WIRING FOR U.S.& S. CO. SIGNAL

GREEN TO LEFT - YELLOW TO RIGHT

NOTES

1. THE SIGNAL WILL DISPLAY YELLOW WHEN POSITIVE BATTERY IS CONNECTED TO TERMINAL POST A+, DIAGRAM S-2542-2; TERMINAL POST M, DIAGRAMS S-2542-1 AND S-2542-3; OR M+, DIAGRAM S-2542-4. THE SIGNAL WILL DISPLAY GREEN WHEN NEGATIVE BATTERY IS CONNECTED TO TERMINAL POSTS DESIGNATED ABOVE.
2. SIGNAL IS SHOWN IN DEENERGIZED POSITION.
3. WIRING SHOWN DASHED IS FURNISHED BY THE MANUFACTURER.
4. ROUNDELS AS SEEN FROM TERMINAL BOARD SIDE OF RELAY.

APPROVED FOR USE

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EXECUTIVE VICE PRESIDENT

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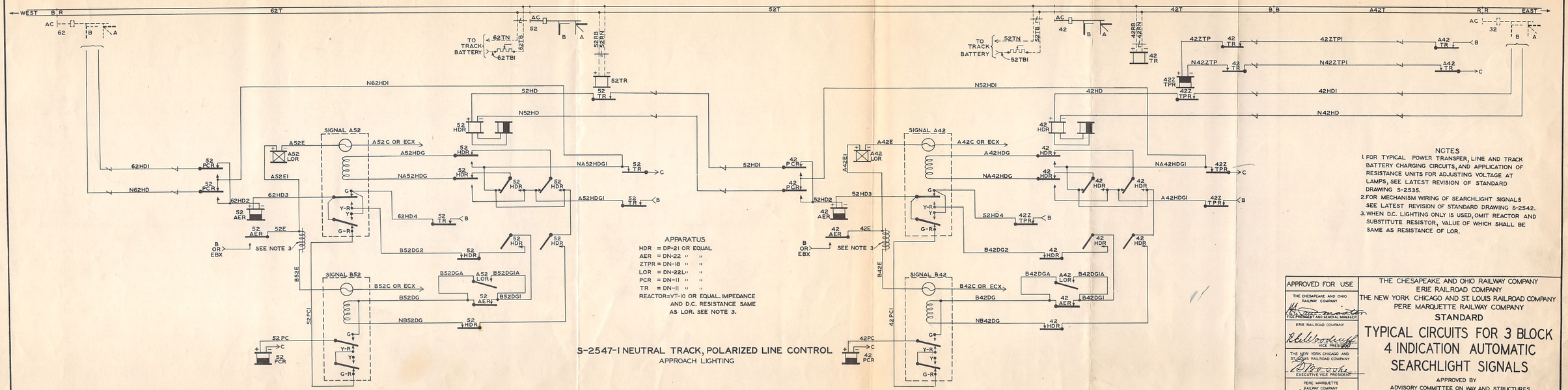
STANDARD MECHANISM WIRING FOR SEARCHLIGHT SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: _____ SEPT. 14, 1937
CHIEF ENGINEER

S-2542-A

S-2547-A



S-2547-1 NEUTRAL TRACK, POLARIZED LINE CONTROL
APPROACH LIGHTING

APPARATUS

HDR = DP-21 OR EQUAL
AER = DN-22 " "
ZTPR = DN-18 " "
LOR = DN-22L " "
PCR = DN-11 " "
TR = DN-11 " "
REACTOR=VT-10 OR EQUAL. IMPEDANCE AND D.C. RESISTANCE SAME AS LOR. SEE NOTE 3.

NOTES

1. FOR TYPICAL POWER TRANSFER, LINE AND TRACK BATTERY CHARGING CIRCUITS, AND APPLICATION OF RESISTANCE UNITS FOR ADJUSTING VOLTAGE AT LAMPS, SEE LATEST REVISION OF STANDARD DRAWING S-2535.
2. FOR MECHANISM WIRING OF SEARCHLIGHT SIGNALS SEE LATEST REVISION OF STANDARD DRAWING S-2542.
3. WHEN D.C. LIGHTING ONLY IS USED, OMIT REACTOR AND SUBSTITUTE RESISTOR, VALUE OF WHICH SHALL BE SAME AS RESISTANCE OF LOR.

APPROVED FOR USE

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ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK CHICAGO AND ST. LOUIS RAILROAD COMPANY
EXECUTIVE VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

K.L.M. K.L.M. C.D.M. A.J.P.

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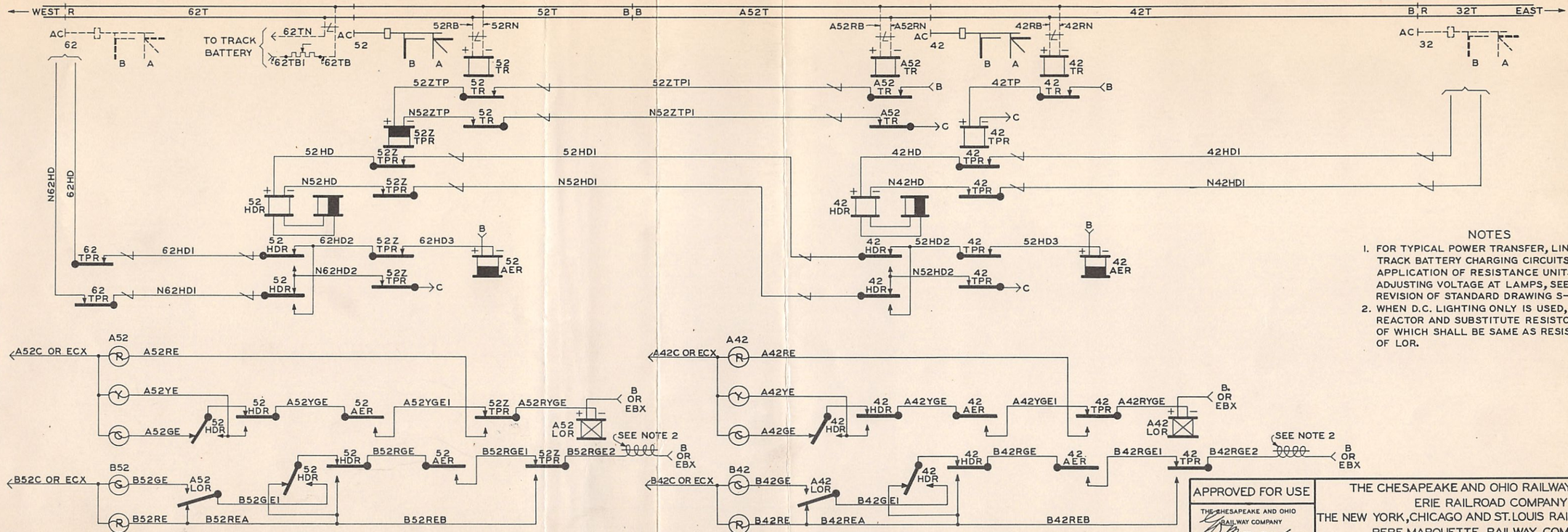
ERIE RAILROAD COMPANY
THE NEW YORK CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

TYPICAL CIRCUITS FOR 3 BLOCK 4 INDICATION AUTOMATIC SEARCHLIGHT SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: SEPT. 14, 1937
CHIEF ENGINEER

S-2547-A



S-2548-1 NEUTRAL TRACK, POLARIZED LINE CONTROL

APPROACH LIGHTING

APPARATUS

HDR= DP-21 OR EQUAL
AER= DN-22 " "
ZTPR=DN-18 " "
LOR= ANL-2 " "
TPR= DN-11 " "
TR = DN-11 " "
REACTOR=VT-10 OR EQUAL. IMPEDANCE AND D.C. RESISTANCE SAME AS LOR. SEE NOTE 2.

NOTES

1. FOR TYPICAL POWER TRANSFER, LINE AND TRACK BATTERY CHARGING CIRCUITS, AND APPLICATION OF RESISTANCE UNITS FOR ADJUSTING VOLTAGE AT LAMPS, SEE LATEST REVISION OF STANDARD DRAWING S-2535.
2. WHEN D.C. LIGHTING ONLY IS USED, OMIT REACTOR AND SUBSTITUTE RESISTOR, VALUE OF WHICH SHALL BE SAME AS RESISTANCE OF LOR.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D. B. Brooke
VICE PRESIDENT

ERIE RAILROAD COMPANY
R. E. Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D. B. Brooke
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A. H. Bowman
VICE PRESIDENT

K.L.M. C.B.P. | C.D.M. | A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

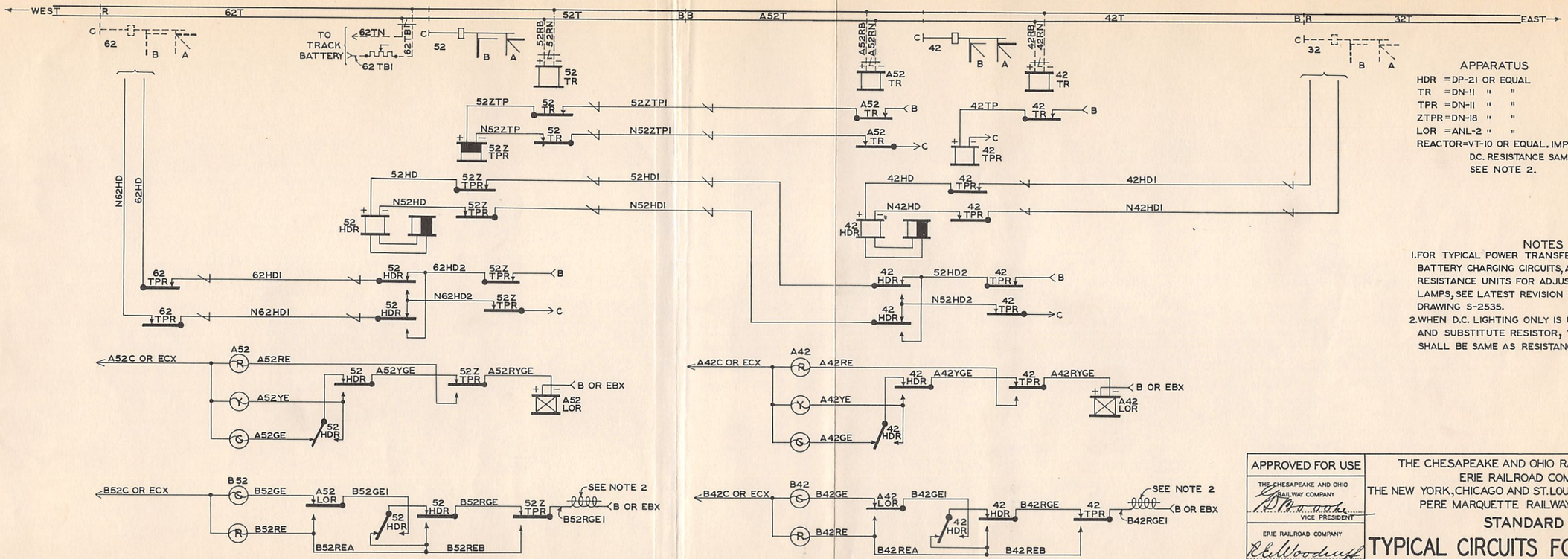
TYPICAL CIRCUITS FOR 3 BLOCK 4 INDICATION AUTOMATIC COLOR LIGHT SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: E. Muchel
CHIEF ENGINEER
JUNE 18, 1935

SHEET 1 OF 2

S-2548



S-2548-2 NEUTRAL TRACK, POLARIZED LINE CONTROL
CONTINUOUS LIGHTING

APPARATUS

HDR =DP-21 OR EQUAL
TR =DN-11 " "
TPR =DN-11 " "
ZTPR=DN-18 " "
LOR =ANL-2 " "
REACTOR=VT-10 OR EQUAL. IMPEDANCE AND D.C. RESISTANCE SAME AS LOR. SEE NOTE 2.

NOTES

1. FOR TYPICAL POWER TRANSFER, LINE AND TRACK BATTERY CHARGING CIRCUITS, AND APPLICATION OF RESISTANCE UNITS FOR ADJUSTING VOLTAGE AT LAMPS, SEE LATEST REVISION OF STANDARD DRAWING S-2535.
2. WHEN D.C. LIGHTING ONLY IS USED, OMIT REACTOR AND SUBSTITUTE RESISTOR, VALUE OF WHICH SHALL BE SAME AS RESISTANCE OF LOR.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT
ERIE RAILROAD COMPANY — VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

K.L.M. K.L.M. | C.D.M. | A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

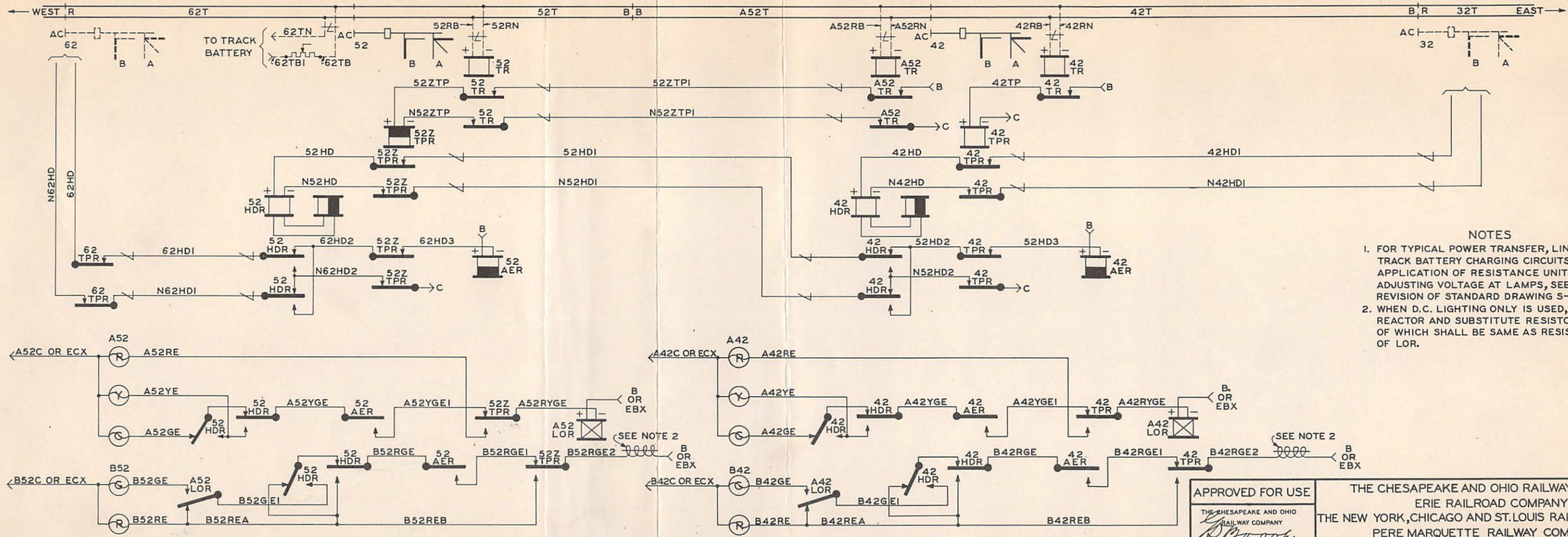
TYPICAL CIRCUITS FOR 3 BLOCK 4 INDICATION AUTOMATIC COLOR LIGHT SIGNALS

APPROVED BY ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: _____ CHIEF ENGINEER JUNE 18, 1935

SHEET 2 OF 2

S-2548



NOTES

1. FOR TYPICAL POWER TRANSFER, LINE AND TRACK BATTERY CHARGING CIRCUITS, AND APPLICATION OF RESISTANCE UNITS FOR ADJUSTING VOLTAGE AT LAMPS, SEE LATEST REVISION OF STANDARD DRAWING S-2535.
2. WHEN D.C. LIGHTING ONLY IS USED, OMIT REACTOR AND SUBSTITUTE RESISTOR, VALUE OF WHICH SHALL BE SAME AS RESISTANCE OF LOR.

S-2548-1 NEUTRAL TRACK, POLARIZED LINE CONTROL

APPROACH LIGHTING

APPARATUS

HDR = DP-21 OR EQUAL
AER = DN-22 " "
ZTPR = DN-18 " "
LOR = ANL-2 " "
TPR = DN-11 " "
TR = DN-11 " "
REACTOR = VT-10 OR EQUAL. IMPEDANCE AND D.C. RESISTANCE SAME AS LOR. SEE NOTE 2.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D. B. Brooke
VICE PRESIDENT

ERIE RAILROAD COMPANY
R. E. Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D. B. Brooke
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A. H. Bowman
VICE PRESIDENT

K.L.M. C.B.P. | C.D.M. | A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

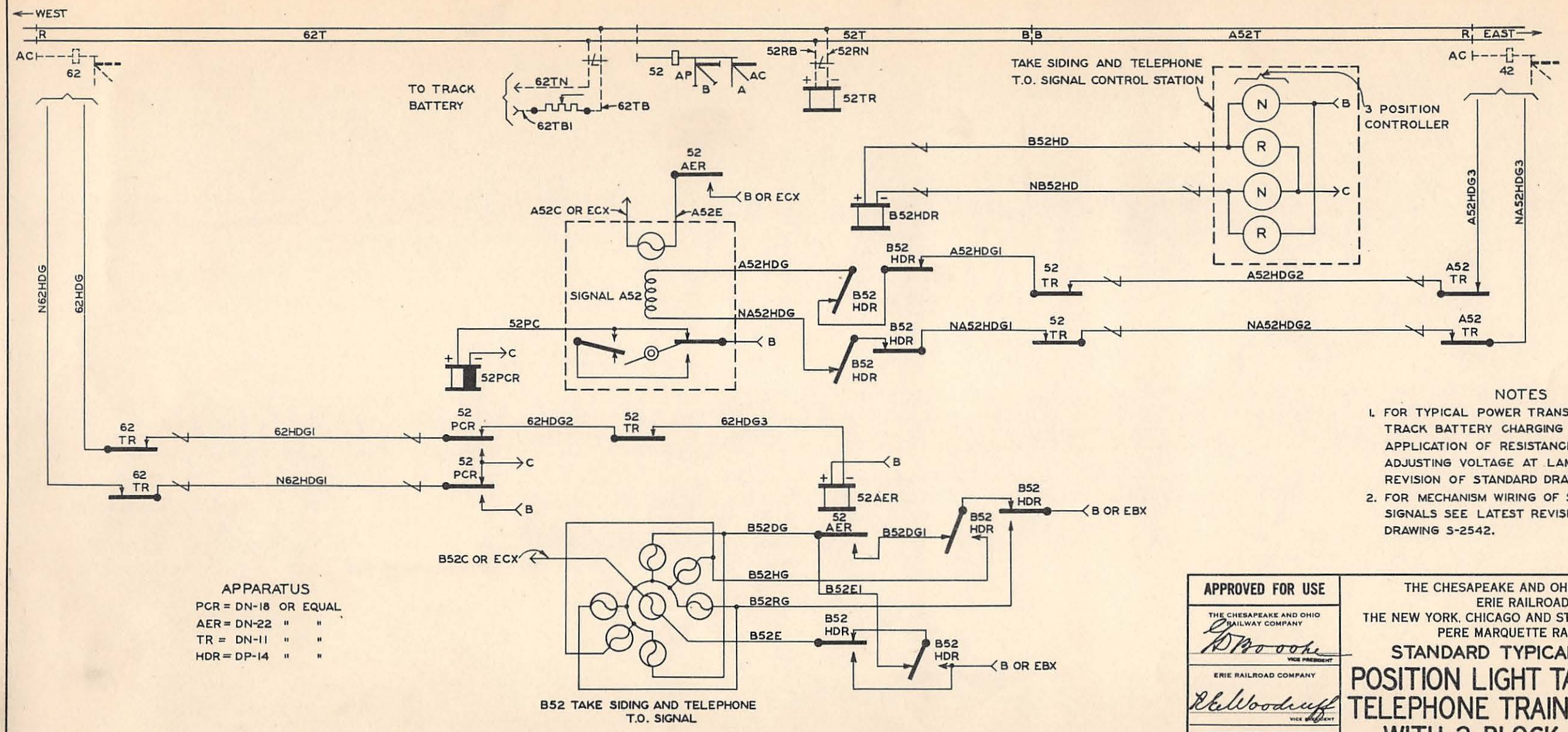
TYPICAL CIRCUITS FOR 3 BLOCK 4 INDICATION AUTOMATIC COLOR LIGHT SIGNALS

APPROVED BY ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: E. Michel, CHIEF ENGINEER — JUNE 18, 1935

SHEET 1 OF 2

S-2548



APPARATUS

PCR = DN-18 OR EQUAL
AER = DN-22 " "
TR = DN-11 " "
HDR = DP-14 " "

NOTES

1. FOR TYPICAL POWER TRANSFER, LINE AND TRACK BATTERY CHARGING CIRCUITS AND APPLICATION OF RESISTANCE UNITS FOR ADJUSTING VOLTAGE AT LAMPS, SEE LATEST REVISION OF STANDARD DRAWING S-2535.
2. FOR MECHANISM WIRING OF SEARCHLIGHT SIGNALS SEE LATEST REVISION OF STANDARD DRAWING S-2542.

S-2556-1 POLARIZED LINE CONTROL

APPROACH LIGHTING

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT

ERIE RAILROAD COMPANY — VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

K.L.M. C.H.W. C.D.M. A.J.P.

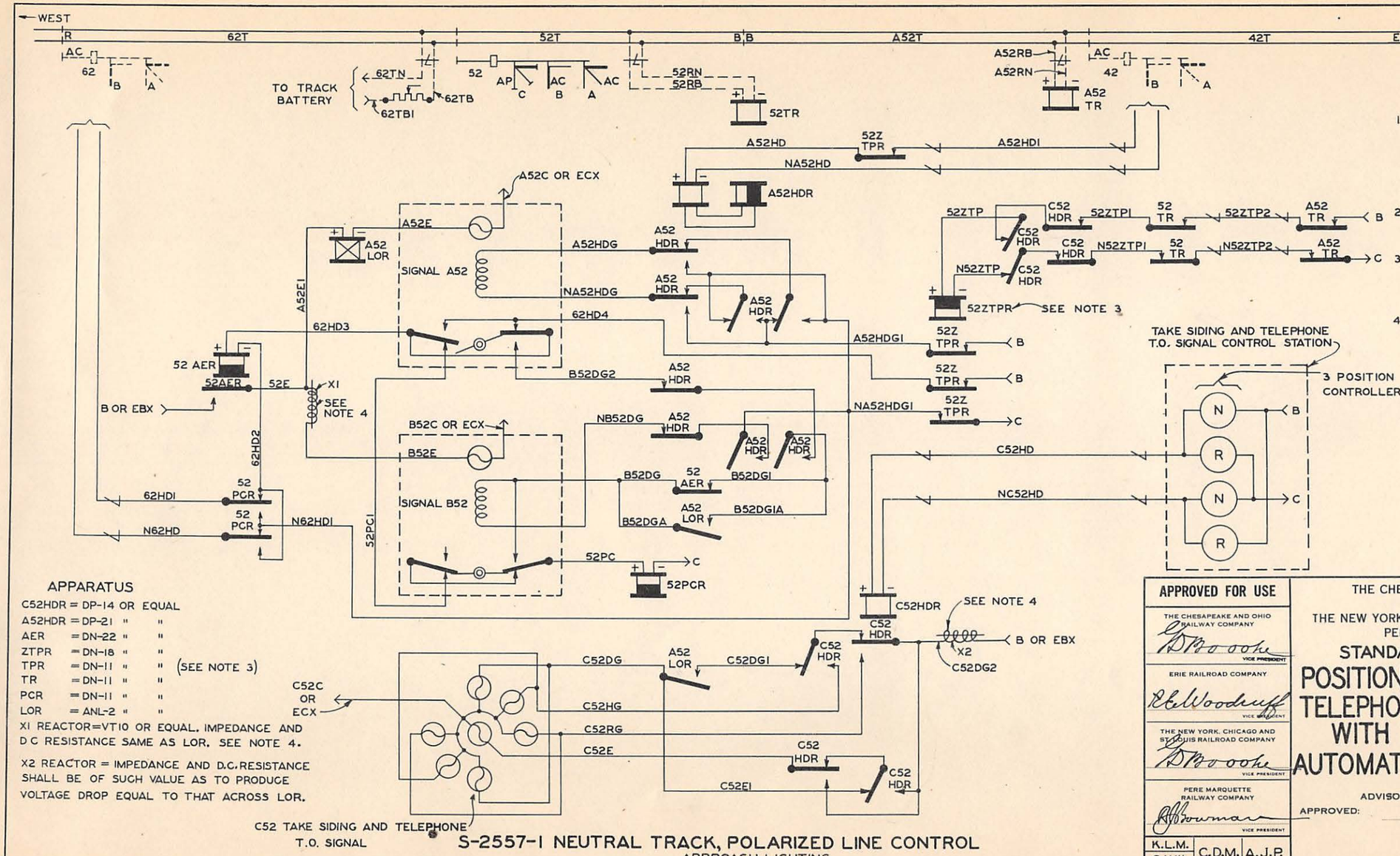
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD TYPICAL CIRCUITS FOR

POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER SIGNAL WITH 2 BLOCK 3 INDICATION AUTOMATIC SEARCHLIGHT SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 18, 1935
CHIEF ENGINEER

S-2556



NOTES

1. FOR TYPICAL POWER TRANSFER, LINE AND TRACK BATTERY CHARGING CIRCUITS, AND APPLICATION OF RESISTANCE UNITS FOR ADJUSTING VOLTAGE AT LAMPS, SEE LATEST REVISION OF STANDARD DRAWING S-2535.
2. FOR MECHANISM WIRING OF SEARCHLIGHT SIGNALS SEE LATEST REVISION OF STANDARD DRAWING S-2542.
3. AN ORDINARY ACTING TRACK REPEATER RELAY SHALL BE USED IN PLACE OF ZTPR IF ENTIRE BLOCK IS CONTROLLED BY ONE TRACK CIRCUIT.
4. WHEN D.C. LIGHTING ONLY IS USED, OMIT REACTORS X1 AND X2, AND SUBSTITUTE RESISTORS.

APPARATUS

C52HDR = DP-14 OR EQUAL
A52HDR = DP-21 " "
AER = DN-22 " "
ZTPR = DN-18 " "
TPR = DN-11 " " (SEE NOTE 3)
TR = DN-11 " "
PCR = DN-11 " "
LOR = ANL-2 " "

X1 REACTOR=VT10 OR EQUAL. IMPEDANCE AND D C RESISTANCE SAME AS LOR. SEE NOTE 4.

X2 REACTOR = IMPEDANCE AND D.C. RESISTANCE SHALL BE OF SUCH VALUE AS TO PRODUCE VOLTAGE DROP EQUAL TO THAT ACROSS LOR.

S-2557-1 NEUTRAL TRACK, POLARIZED LINE CONTROL
APPROACH LIGHTING

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT
ERIE RAILROAD COMPANY — VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT

K.L.M. | C.H.W. | C.D.M. | A.J.P.

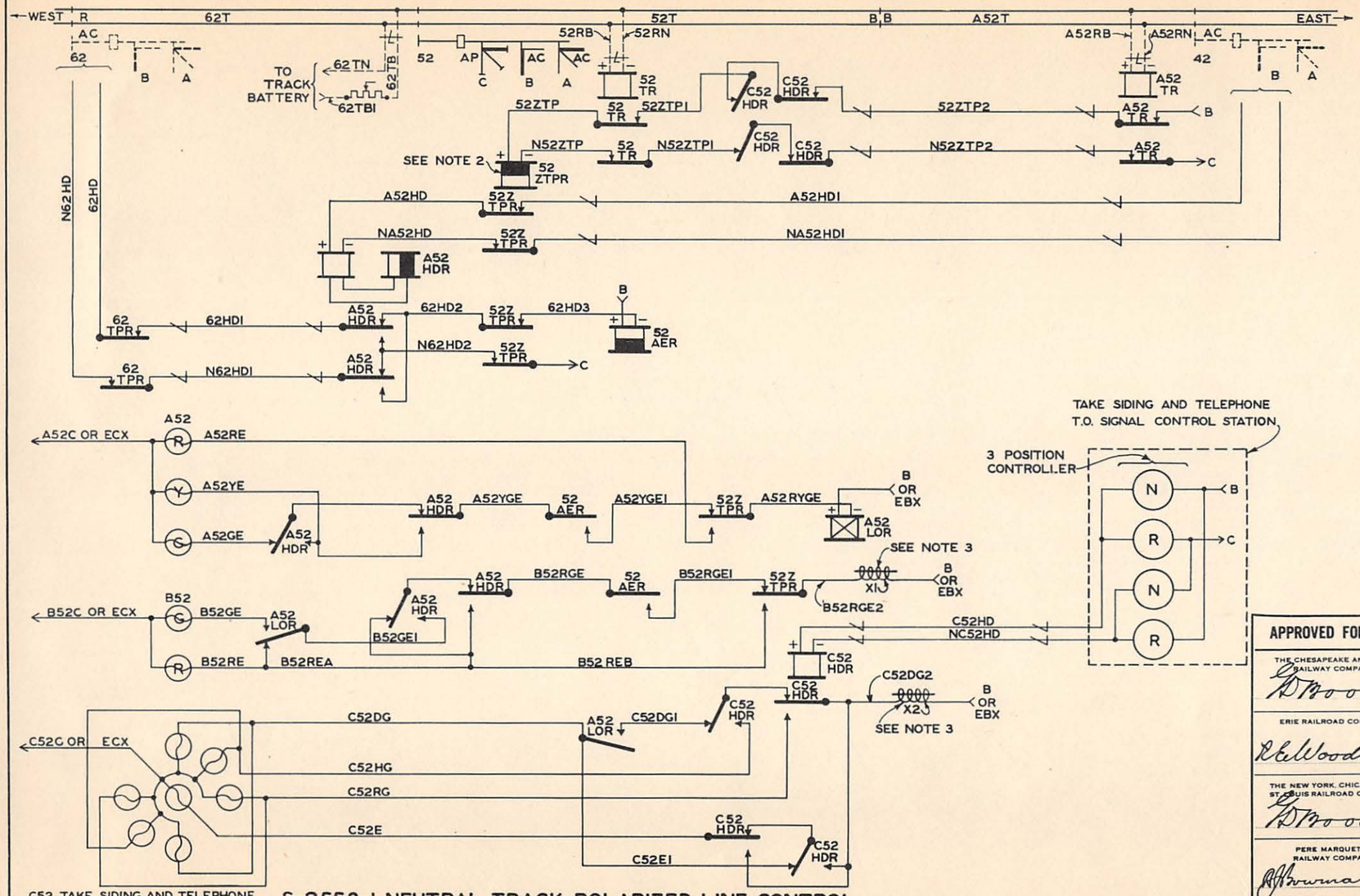
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD TYPICAL CIRCUITS FOR

POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER SIGNAL WITH 3 BLOCK 4 INDICATION AUTOMATIC SEARCHLIGHT SIGNALS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: CHIEF ENGINEER JUNE 18, 1935

S-2557



S-2558-1 NEUTRAL TRACK, POLARIZED LINE CONTROL
APPROACH LIGHTING

NOTES

1. FOR TYPICAL POWER TRANSFER, LINE AND TRACK BATTERY CHARGING CIRCUITS, AND APPLICATION OF RESISTANCE UNITS FOR ADJUSTING VOLTAGE AT LAMPS, SEE LATEST REVISION OF STANDARD DRAWING S-2535.
2. AN ORDINARY ACTING TRACK REPEATER RELAY SHALL BE USED IN PLACE OF ZTPR IF ENTIRE BLOCK IS CONTROLLED BY ONE TRACK CIRCUIT.
3. WHEN D.C. LIGHTING ONLY IS USED, OMIT REACTORS X1 AND X2, AND SUBSTITUTE RESISTORS.

APPARATUS

A52HDR = DP-21 OR EQUAL
C52HDR = DP-14 " "
TR = DN-11 " "
ZTPR = DN-18 " "
TPR = DN-11 " " (SEE NOTE 2)
AER = DN-22 " "
LOR = ANL-2 " "
X1 REACTOR = VT-10 OR EQUAL. IMPEDANCE AND D.C. RESISTANCE SAME AS LOR. SEE NOTE 3.
X2 REACTOR = IMPEDANCE AND D.C. RESISTANCE SHALL BE OF SUCH VALUE AS TO PRODUCE VOLTAGE DROP EQUAL TO THAT ACROSS LOR.

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Bowoohe, VICE PRESIDENT
ERIE RAILROAD COMPANY — R E Woodruff, VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D Bowoohe, VICE PRESIDENT
PERE MARQUETTE RAILWAY COMPANY — R H Bowman, VICE PRESIDENT

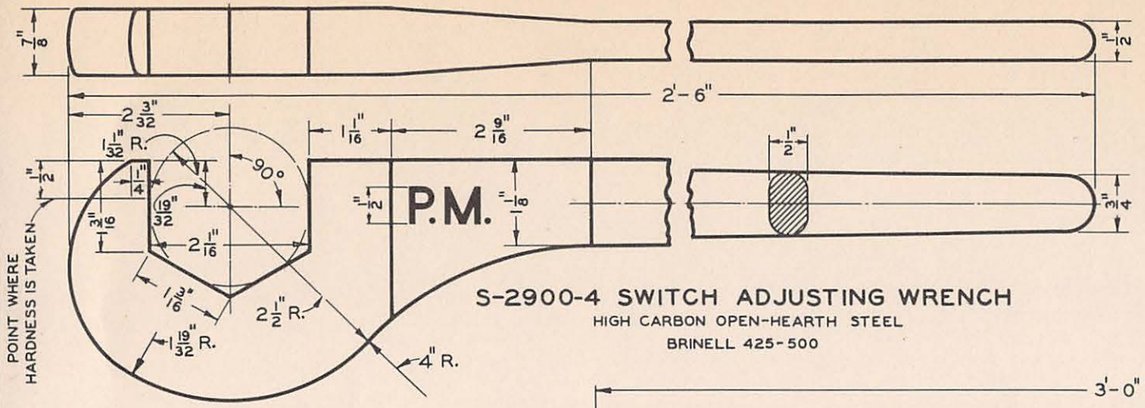
K.L.M. | K.L.M. | C.D.M. | A.J.P.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD TYPICAL CIRCUITS FOR POSITION LIGHT TAKE SIDING AND TELEPHONE TRAIN ORDER SIGNAL WITH 3 BLOCK 4 INDICATION AUTOMATIC COLOR LIGHT SIGNALS

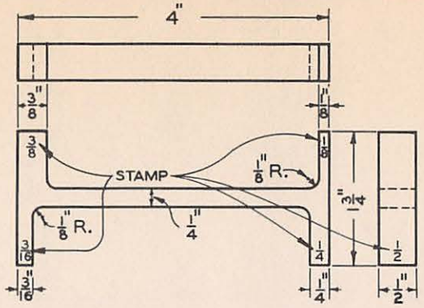
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: A Muchel, CHIEF ENGINEER — JUNE 18, 1935

S-2558



S-2900-4 SWITCH ADJUSTING WRENCH

HIGH CARBON OPEN-HEARTH STEEL
BRINELL 425-500

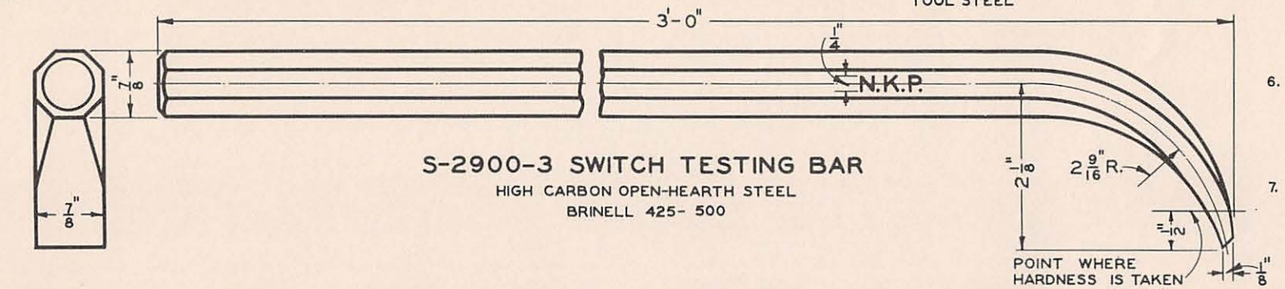


S-2900-1 SWITCH OBSTRUCTION GAGE

(H TYPE)
TOOL STEEL

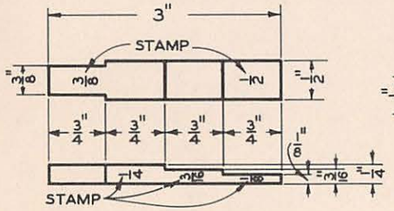
NOTES

1. NAME OR INITIALS OF RAILROAD SHALL BE STAMPED ON SWITCH ADJUSTING WRENCHES AND TESTING BAR AS FOLLOWS:
   CHESAPEAKE AND OHIO ____ C. & O.
   ERIE ____ ERIE
   NICKEL PLATE ____ N.K.P.
   PERE MARQUETTE ____ P. M.
2. GAGES SHALL BE MADE OF TOOL STEEL MACHINED TO .005" OVERSIZE AND FINISHED BY FILING.
3. GAGES SHALL BE TEMPERED BY HEATING IN ELECTRIC FURNACE, OIL QUENCHING AND REHEATING TO REMOVE BRITTLENESS.
4. SWITCH ADJUSTING WRENCH JAW SHALL BE MILLED TO EXACT DIMENSIONS SHOWN.
5. ONE WRENCH SHALL BE TESTED FROM EACH LOT OF FIVE DOZEN OR LESS BY APPLYING A LOAD OF 300 POUNDS AT A POINT DISTANT FROM THE JAW END EQUAL TO 95 PER CENT OF THE TOTAL LENGTH ONE MINUTE WITHOUT ANY SPREAD OF JAW OR PERMANENT SET IN HANDLE.
6. ONE SWITCH TESTING BAR SHALL BE TESTED FROM EACH LOT OF FIVE DOZEN OR LESS BY APPLYING A LOAD OF 200 POUNDS AT A POINT DISTANT FROM THE CURVED END EQUAL TO 95 PER CENT OF THE TOTAL LENGTH ONE MINUTE WITHOUT ANY PERMANENT SET.
7. TOLERANCE FOR SWITCH ADJUSTING WRENCHES AND TESTING BAR: 2 PER CENT ON LENGTH AND 5 PER CENT ON CROSS SECTION.



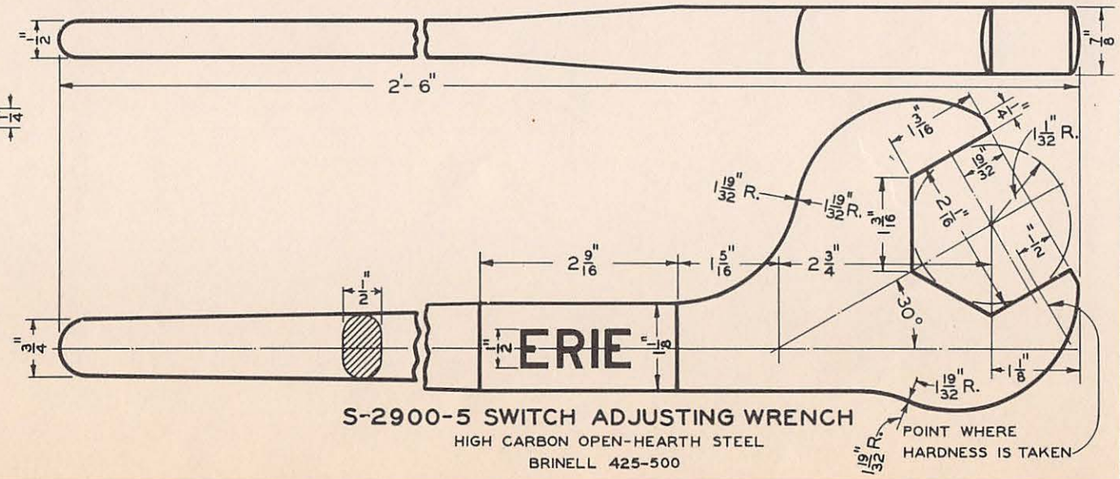
S-2900-3 SWITCH TESTING BAR

HIGH CARBON OPEN-HEARTH STEEL
BRINELL 425- 500



S-2900-2 SWITCH OBSTRUCTION GAGE

(STRAIGHT TYPE)
TOOL STEEL



S-2900-5 SWITCH ADJUSTING WRENCH

HIGH CARBON OPEN-HEARTH STEEL
BRINELL 425-500

SCALE IN INCHES
0 1 2 3

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT		
C.H.W.	C.D.M.	A.J.P.
C.H.W.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD

SWITCH TESTING BAR, ADJUSTING WRENCHES, AND OBSTRUCTION GAGES

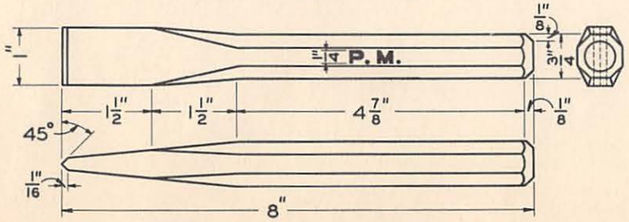
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: _____ CHIEF ENGINEER APRIL 17, 1934

S-2900

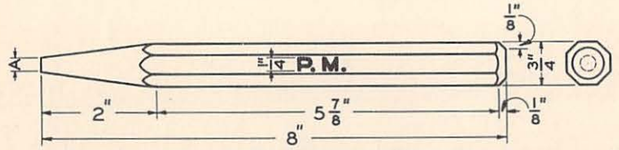
S-2901-1 TOMMY BAR
STEEL (SEE NOTE 2)

S-2901-2 DRIFT PUNCH FOR 3/8" CHANNEL PIN, A= 9/32", B= 3/8"
S-2901-3 DRIFT PUNCH FOR 9/32" CHANNEL PIN, A= 3/16", B= 9/32"
TOOL STEEL (SEE NOTE 3)

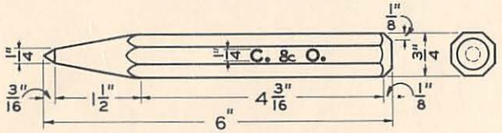
S-2901-6 DRIFT PUNCH FOR PIPE RIVET
TOOL STEEL (SEE NOTE 3)



S-2901-8 COLD CHISEL
TOOL STEEL (SEE NOTE 3)



S-2901-4 STARTING PUNCH FOR 3/8" CHANNEL PIN, A= 11/32"
S-2901-5 STARTING PUNCH FOR 9/32" CHANNEL PIN, A= 1/4"
TOOL STEEL (SEE NOTE 3)



S-2901-7 CENTER PUNCH
TOOL STEEL (SEE NOTE 3)

NOTES

1. NAME OR INITIALS OF RAILROAD SHALL BE STAMPED ON TOMMY BAR, CENTER PUNCH, COLD CHISEL, AND PUNCHES AS FOLLOWS:
   CHESAPEAKE AND OHIO _____ C. & O.
   ERIE _____ ERIE
   NICKEL PLATE _____ N. K. P.
   PERE MARQUETTE _____ P. M.
2. TOMMY BAR SHALL BE MADE OF STEEL OF SUCH QUALITY TO INSURE TOUGHNESS WHEN HARDENED AND DRAWN. THE BRINELL HARDNESS ½ INCH FROM POINTS SHALL BE 375-450.
3. COLD CHISEL AND PUNCHES SHALL BE MADE OF TOOL STEEL SUITABLE FOR COLD WORKING TOOLS. THEY SHALL BE HARDENED AND DRAWN TO GIVE HARDNESS AS FOLLOWS:
   ½ INCH FROM POINTS, BRINELL 477-532
   ½ INCH FROM HEADS, BRINELL 286-340

SCALE IN INCHES
0 1 2 3 4

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
R. Kell Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
EXECUTIVE VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

C. H. W.	C. D. M.	A. J. P.
C. B. P.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

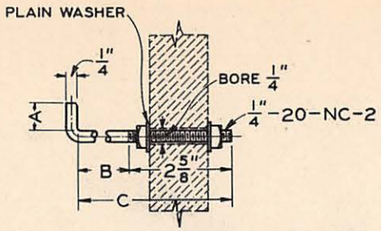
STANDARD
SMALL TOOLS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: _____ MAR. 15, 1937
CHIEF ENGINEER

S-2901

BILL OF TOOLS

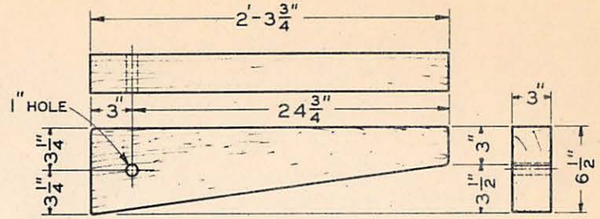
FIGURE	DESCRIPTION	REQUIRED	REFERENCE
(1)	15 INCH MONKEY WRENCH	1	——
(2)	1½ LB. MACHINIST'S HAMMER	1	——
(3)	16 INCH TOMMY BAR	1	——
(4)	2'-6" SWITCH ADJUSTING WRENCH	1	S-2900-4
AND/OR (4) A	" " " "	1	S-2900-5
(5)	9 INCH COLD CHISEL	1	——
(6)	3'-0" SPIKE MAUL HANDLE	1	R-526
(7)	SPIKE MAUL	1	R-557
(8)	TRACK SPIKES	4	R-586
(9)	CLAW BAR	1	R-551



S-2905-4 BOLT COMPLETE WITH NUTS AND WASHERS
S-2905-5 " " " " " " "
S-2905-6 " " " " " " "
S-2905-7 " " " " " " "

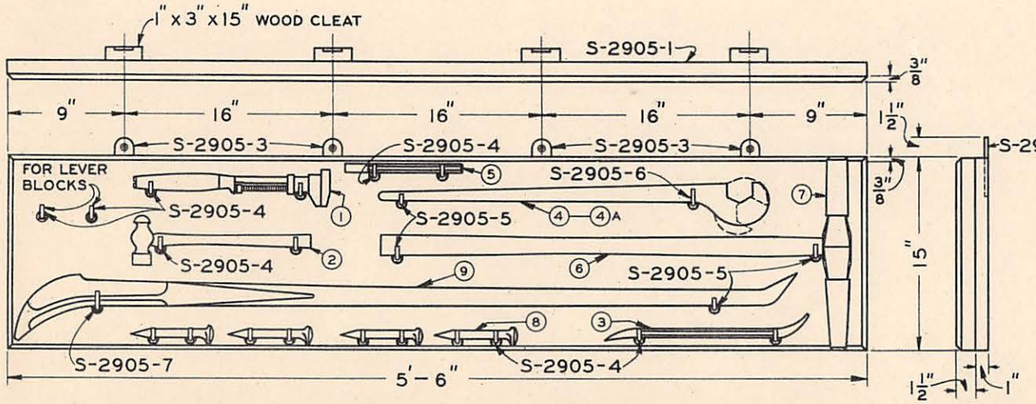
O.-H. STEEL
SCALE (2)

A	B	C	REQUIRED
3/4"	3/4"	3 3/8"	18
3/4"	1 1/2"	4 1/8"	4
1 1/4"	1 1/2"	4 1/8"	1
1 1/2"	2"	4 5/8"	1



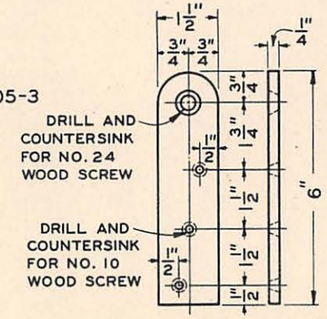
S-2905-8 SWITCH WEDGE
SCALE (1)

NOTES
1. BOARD SHALL BE MADE FROM WELL SEASONED OAK WOOD, AND GIVEN ONE COAT OF FILLER AND TWO COATS OF VARNISH.
2. ALL TOOLS SHALL BE PAINTED RED.
3. CLEATS SHALL BE FASTENED TO BOARD WITH NO. 10 - 1¾" FLAT HEAD WOOD SCREWS.
4. SWITCH WEDGE SHALL BE MADE FROM WELL SEASONED OAK WOOD AND PAINTED WITH CREOSOTE.



S-2905-1 TOOL AND EQUIPMENT BOARD ONLY
S-2905-2 " " " " COMPLETE WITH TOOLS

SCALE (1)
TOOLS SHOWN ON FRONT ELEVATION ONLY



S-2905-3 HANGER
O.-H. STEEL
SCALE (2)

SCALE IN INCHES
(1) 0 3 6 9 12 15 18
(2) 0 1 2 3 4 5 6

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
D Brooke VICE PRESIDENT

ERIE RAILROAD COMPANY
R E Woodruff VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
D Brooke VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
J H Bowman VICE PRESIDENT

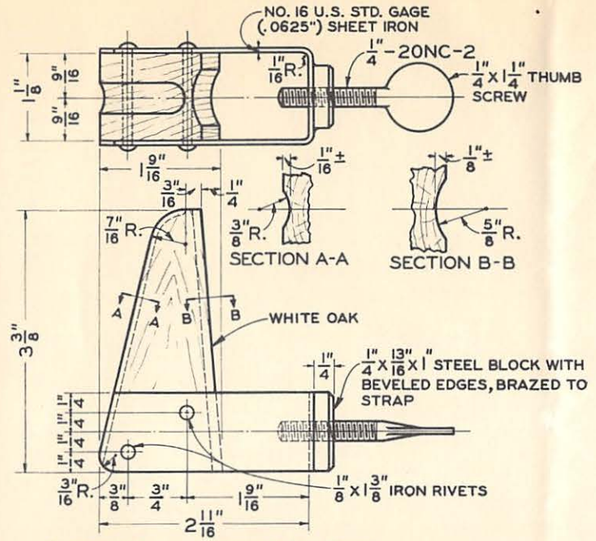
C.H.W.	C.D.M.	A.J.P.
C.B.P.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

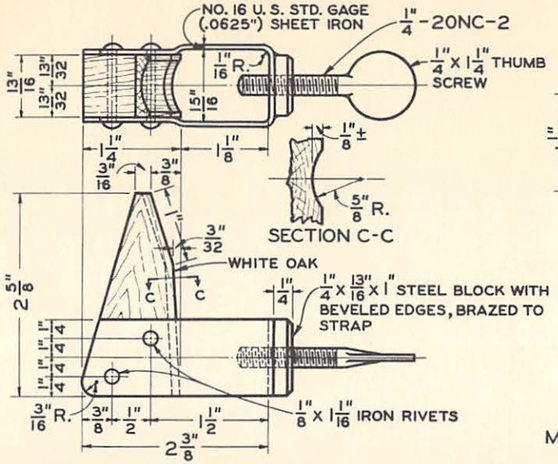
STANDARD TOOL AND EQUIPMENT BOARD FOR INTERLOCKING TOWERS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: W Winchell CHIEF ENGINEER OCT. 16.1934.

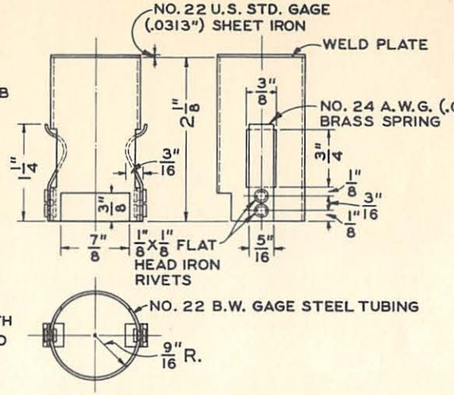
S-2905


NO. 16 U.S. STD. GAGE (.0625") SHEET IRON
1/4"-20NC-2
1/4" X 1 1/4" THUMB SCREW
SECTION A-A
SECTION B-B
WHITE OAK
1/4" X 13/16" X 1" STEEL BLOCK WITH BEVELED EDGES, BRAZED TO STRAP
1/8" X 1 3/8" IRON RIVETS

S-2907-1 LEVER BLOCK
FOR S-8 LEVER – ROUND TYPE


NO. 16 U. S. STD. GAGE (.0625") SHEET IRON
1/4"-20NC-2
1/4" X 1 1/4" THUMB SCREW
SECTION C-C
WHITE OAK
1/4" X 13/16" X 1" STEEL BLOCK WITH BEVELED EDGES, BRAZED TO STRAP
1/8" X 1 1/16" IRON RIVETS

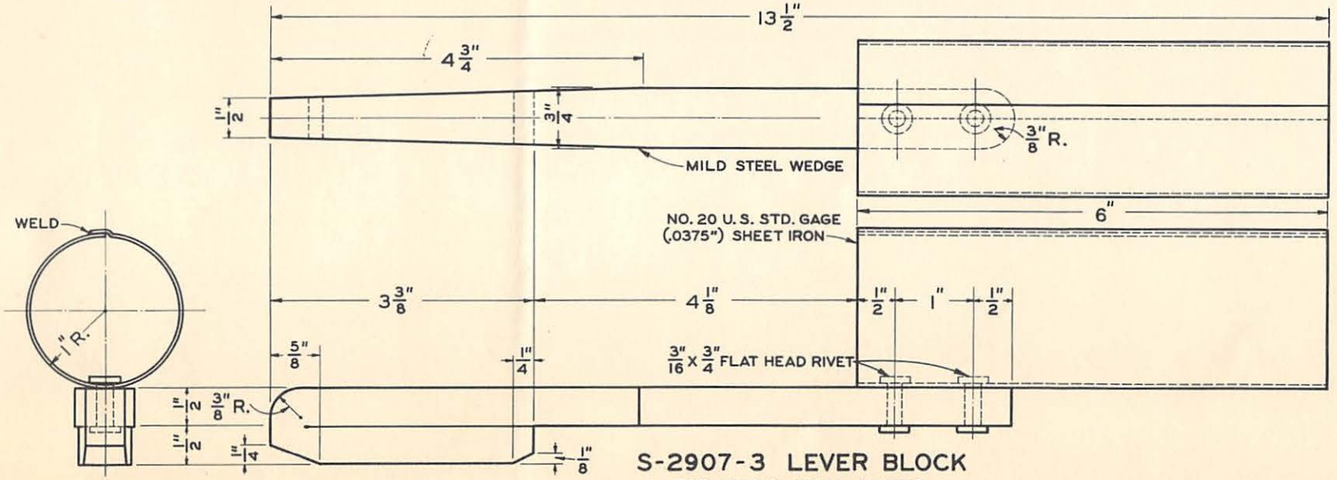
S-2907-2 LEVER BLOCK
FOR S-8 LEVER – PARABOLIC SHORT



S-2907-4 LEVER BLOCK
FOR U. S. & S. CO. ELECTRO–PNEUMATIC LEVER WITH ROUND LATCH HANDLE

NOTE

ALL PARTS EXCEPT THREADED PORTIONS SHALL BE PAINTED RED.



S-2907-3 LEVER BLOCK
FOR MECHANICAL LEVER

SCALE IN INCHES
0 1 2 3

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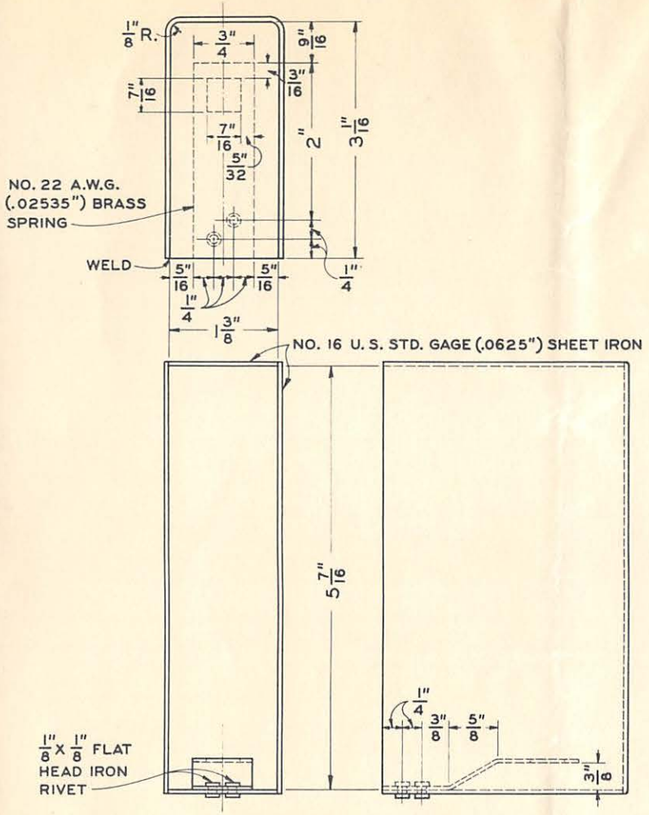
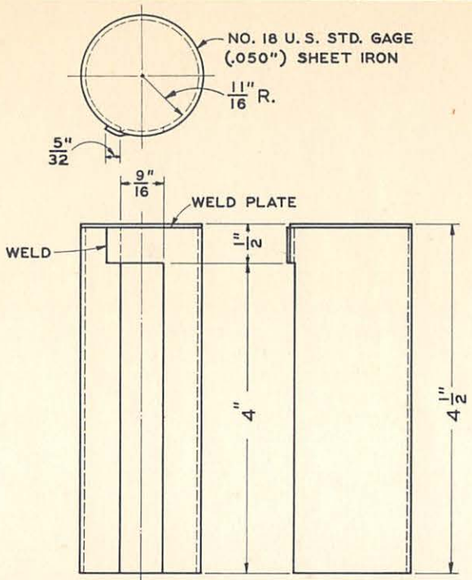
STANDARD BLOCKING DEVICES FOR INTERLOCKING MACHINE LEVERS

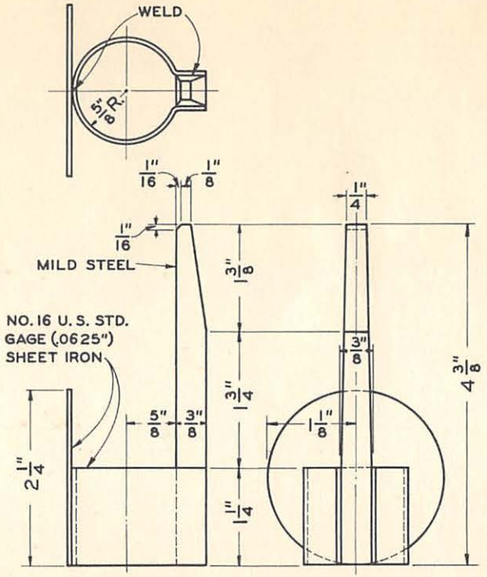
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 22, 1937
CHIEF ENGINEER



S-2907-5 LEVER BLOCK
FOR G. R. S. CO. MODEL 2 UNIT LEVER TYPE

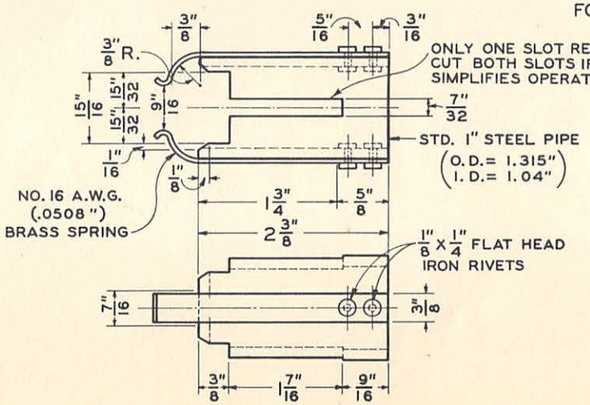


S-2907-6 LEVER BLOCK
FOR G. R. S. CO. MODEL 2 LEVER



S-2907-7 LEVER BLOCK
FOR FEDERAL TYPE ELECTRIC LEVER

NOTE
ALL PARTS SHALL BE PAINTED RED.



S-2907-8 LEVER BLOCK
FOR U. S. & S. CO. THUMB PIECE TYPE LEVERS

SCALE IN INCHES
0 1 2 3

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STANDARD BLOCKING DEVICES FOR INTERLOCKING MACHINE LEVERS

APPROVED BY
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APPROVED: JUNE 22, 1937
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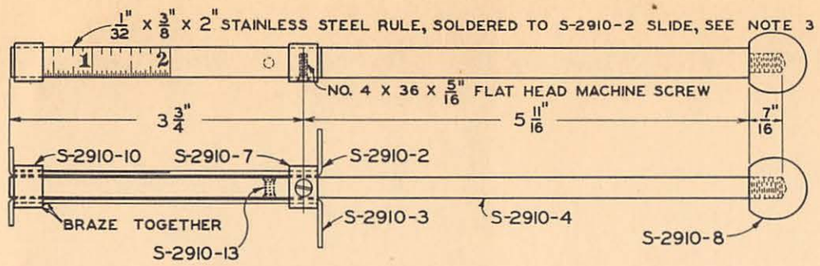
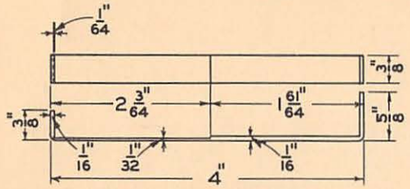
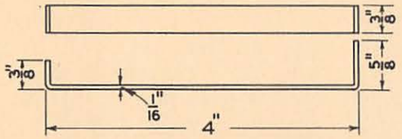
SHEET 2 OF 2
S-2907



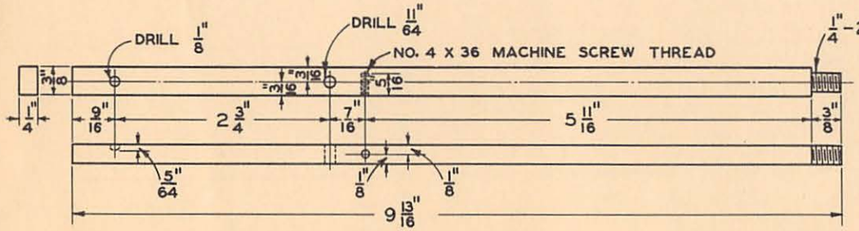
S-2910-1 GAGE COMPLETE



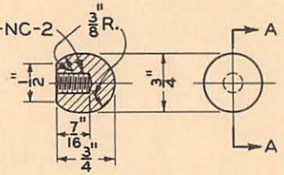
S-2910-2 SLIDE
STAINLESS STEEL



S-2910-3 SLIDE
STAINLESS STEEL



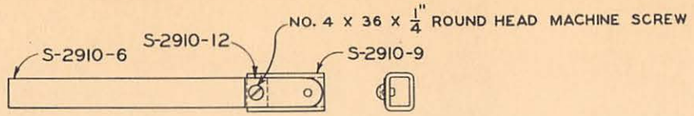
S-2910-4 STAFF
STAINLESS STEEL



S-2910-8 KNOB
STAINLESS STEEL

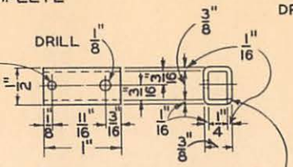
NOTES

1. GAGE PARTS SHALL BE MACHINED AND FINISHED SO AS TO PROVIDE SMOOTH MOVEMENT OF SLIDES AND TIGHT FIT OF GAGE EXTENSION.
2. FOR USE OF GAGE SEE SHEETS 2 AND 3.
3. THE SOLDER SHALL BE RYERSONS ALLEGHENY METAL SOLDER OR EQUAL USED WITH RYERSONS ALLEGHENY SOLDERING FLUX OR EQUAL. AFTER THE SOLDER IS APPLIED TO THE JOINT, THE SLIDE SHALL BE PLACED BETWEEN HOT CLAMPS AND ALLOWED TO COOL.

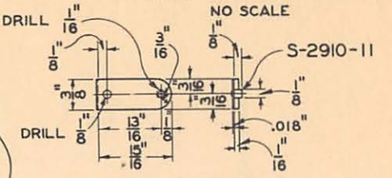


S-2910-5 GAGE EXTENSION COMPLETE

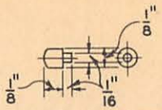
S-2910-6 EXTENSION
STAINLESS STEEL



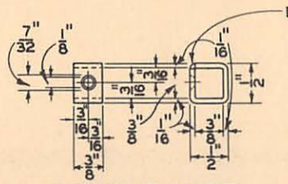
S-2910-9 COUPLING
STAINLESS STEEL



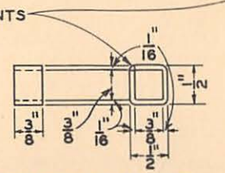
S-2910-12 SPRING
PHOSPHOR BRONZE



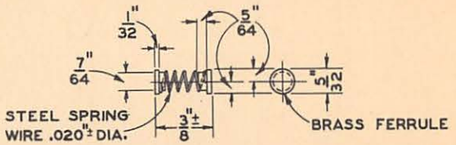
S-2910-11 RIVET
COPPER OR PHOSPHOR BRONZE
NO SCALE



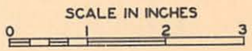
S-2910-7 GUIDE
STAINLESS STEEL



S-2910-10 GUIDE
STAINLESS STEEL



S-2910-13 SPRING COMPLETE
NO SCALE



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STANDARD GAGE FOR CHECKING LOCKING TOLERANCES OF INTERLOCKING MACHINES

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: MAR. 11, 1935
CHIEF ENGINEER

SHEET 1 OF 4

S-2910

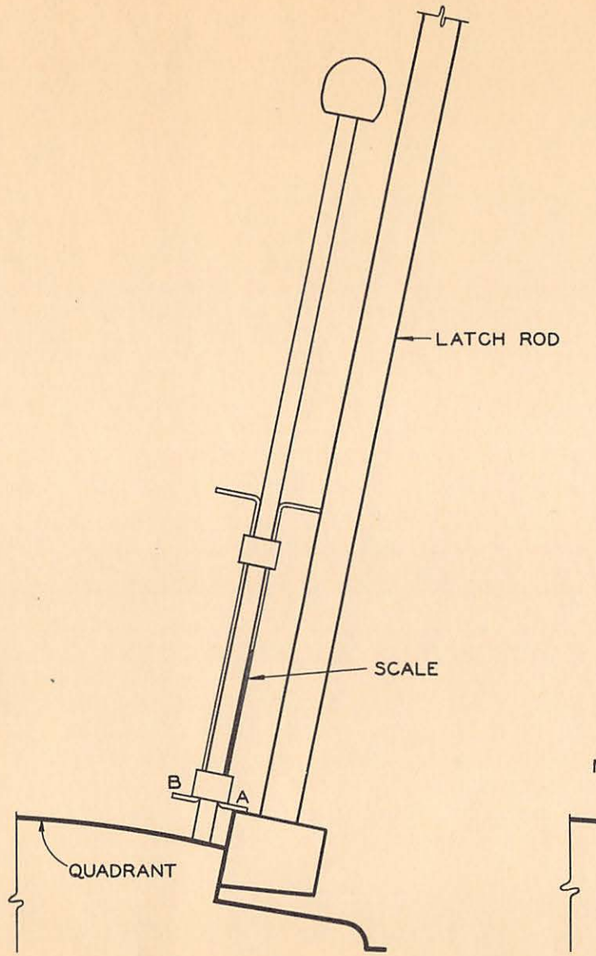

FIGURE 1

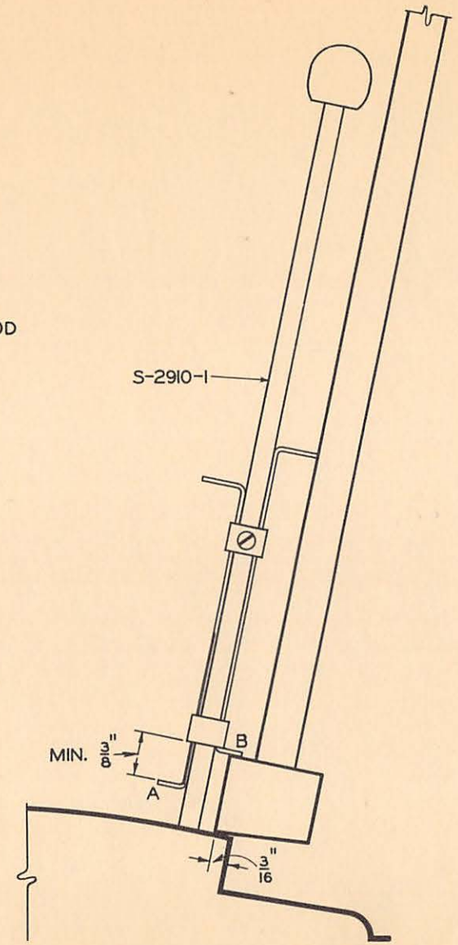

FIGURE 2

USE OF GAGE ON MECHANICAL MACHINE

NOTES

METHOD OF CHECKING LOCKING TOLERANCES

1. LOCK THE LEVER WITH LEVER AGAINST WHICH IT IS TO BE CHECKED AND LIFT LATCH AS FAR AS POSSIBLE. WITH BOTH SLIDES PUSHED DOWN TO END OF GAGE AND WITH GAGE PARALLEL TO LATCH ROD PLACE LUG "A" ON TOP OF LATCH ROD PROJECTION AND PUSH GAGE DOWN UNTIL END RESTS ON TOP OF QUADRANT, FIGURE 1.
2. SET LATCH ON TOP OF QUADRANT AND PLACE LUG "B" ON TOP OF LATCH ROD PROJECTION AND PUSH GAGE DOWN UNTIL THE END RESTS ON TOP OF QUADRANT, FIGURE 2. DIFFERENCE BETWEEN POSITION OF GAGE IN FIGURE 1 AND FIGURE 2 AS READ ON SCALE IS THE DISTANCE BETWEEN BOTTOM OF LATCH ROD AND TOP OF QUADRANT WITH ALL SLACK TAKEN UP IN LOCKING.

NO SCALE

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STANDARD GAGE FOR CHECKING LOCKING TOLERANCES OF INTERLOCKING MACHINES

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: C. D. Mitchel — CHIEF ENGINEER — MAR. 11, 1935

SHEET 2 OF 4

S-2910

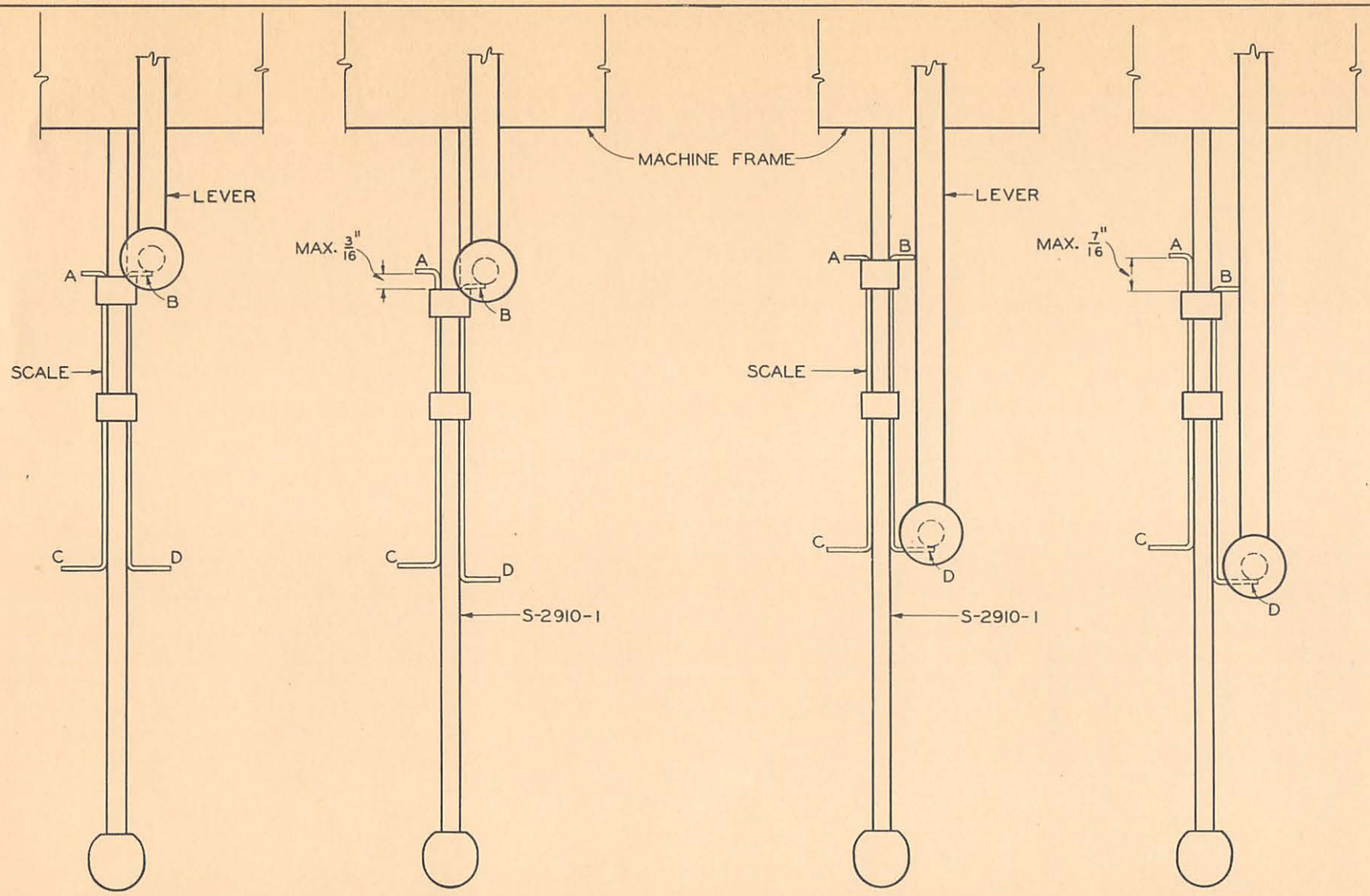

FIGURE 1 FIGURE 2 FIGURE 3 FIGURE 4

LEVER IN NORMAL POSITION

LEVER IN REVERSE POSITION

USE OF GAGE ON G.R.S. TYPE ELECTRIC MACHINES

NOTES

METHOD OF CHECKING LOCKING TOLERANCES

NORMAL POSITION OF LEVER

1. PLACE LEVER IN FULL NORMAL POSITION AS SHOWN IN FIGURE 1 AND LOCK BY LEVER AGAINST WHICH IT IS TO BE CHECKED. PULL BOTH SLIDES TOWARD KNOB OF GAGE, PLACE GAGE PARALLEL TO LEVER, WITH END AGAINST MACHINE FRAME. PUSH SLIDES DOWN ON GAGE UNTIL LUG "B" RESTS AGAINST LEVER.
2. PULL LEVER OUT AS FAR AS POSSIBLE AS SHOWN IN FIGURE 2, MOVING LUG "B". SCALE READING IS LOST MOTION – NORMAL.

REVERSE POSITION OF LEVER

1. PLACE LEVER IN FULL REVERSE POSITION AND LOCK BY LEVER AGAINST WHICH IT IS TO BE CHECKED. MOVE LEVER TOWARD NORMAL POSITION AS FAR AS POSSIBLE AS SHOWN IN FIGURE 3. PLACE GAGE PARALLEL TO LEVER, WITH END AGAINST MACHINE FRAME AND PUSH SLIDES DOWN ON GAGE UNTIL LUG "D" RESTS AGAINST LEVER.
2. PULL LEVER OUT AS FAR AS POSSIBLE AS SHOWN IN FIGURE 4, MOVING LUG "B". SCALE READING IS LOST MOTION – REVERSE.
3. ON SOME MACHINES ON WHICH CABINETS HAVE BEEN CHANGED IT MAY BE NECESSARY TO USE THE GAGE EXTENSION TO TAKE REVERSE READINGS AND LUG "D" INSTEAD OF "B" USED ON NORMAL READINGS.

NO SCALE

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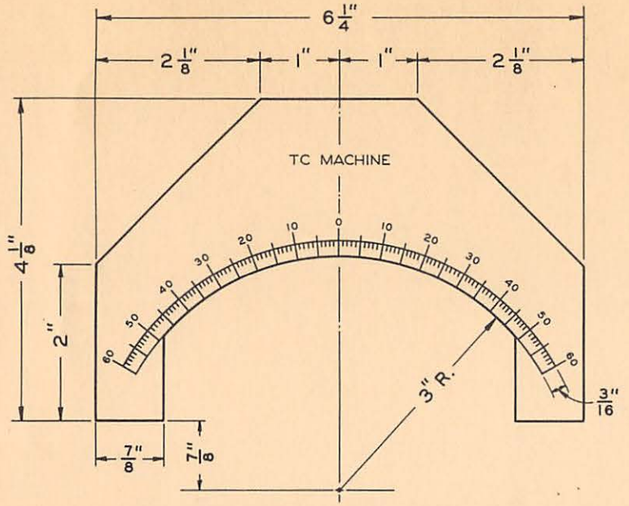
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

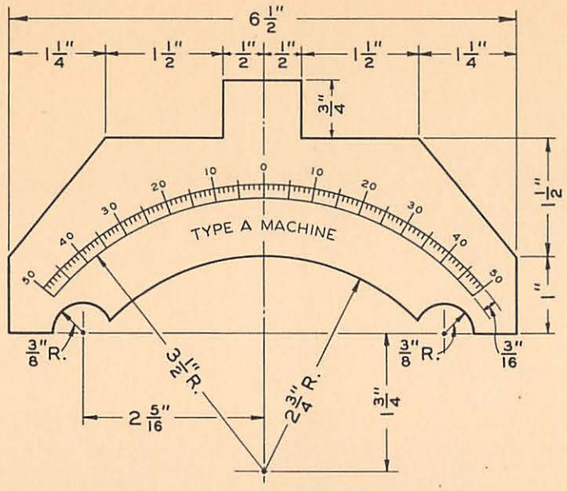
APPROVED: W Mitchell CHIEF ENGINEER MAR. 11, 1935

SHEET 3 OF 4

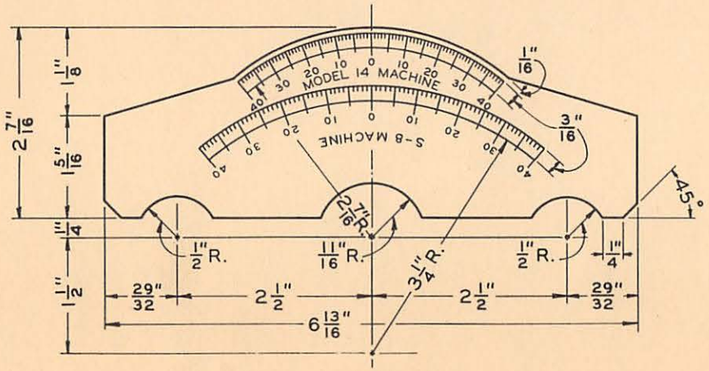
S-2910



S-2910-19 PROTRACTOR GAGE
FOR U.S.& S. CO. STYLE "TC" MACHINE



S-2910-20 PROTRACTOR GAGE
FOR G.R.S. CO. TYPE "A" MACHINE



S-2910-21 PROTRACTOR GAGE
FOR MODEL 14 AND S-8 MACHINES

NOTES

1. PROTRACTOR GAGE S-2910-19 AND S-2910-21 SHALL BE MADE OF 1/16" THICK TRANSPARENT CELLULOID.
2. PROTRACTOR GAGE S-2910-20 SHALL BE MADE OF .041" THICK TRANSPARENT CELLULOID.
3. DEGREE LINES, LETTERS, AND NUMBERS SHALL BE STAMPED INTO FACE OF PROTRACTOR AND COLORED WHITE.
4. FOR TOLERANCES IN MECHANICAL LOCKING SEE LATEST REVISION OF STANDARD SPECIFICATIONS S-1901, FIELD SPECIFICATIONS INCLUDING INSTRUCTIONS FOR INSPECTING AND TESTING MECHANICAL LOCKING OF INTERLOCKING MACHINES.

SCALE IN INCHES
0 1 2 3

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APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: E E Russell, CHIEF ENGINEER — MAR. 11, 1935

SHEET 4 OF 4
S-2910

INSULATED RAIL JOINTS

TRACK CIRCUITS IN BOTH DIRECTIONS

TRACK CIRCUITS ON LEFT
NONE ON RIGHT

TRACK CIRCUITS ON RIGHT
NONE ON LEFT

WATER TANK

WATER COLUMN

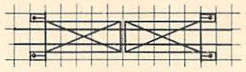
BRIDGE
DESIGNATE TYPE

TYPES OF BRIDGES
TRES = TRESTLE
TPG = THROUGH PLATE GIRDER
DPG = DECK PLATE GIRDER
DT = DECK TRUSS
PT = PONY TRUSS, THROUGH BRIDGE
TT = THROUGH TRUSS

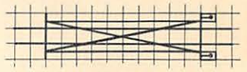
BRIDGES

LIFT SPAN

DRAW SPAN



BASCULE
DOUBLE LEAF



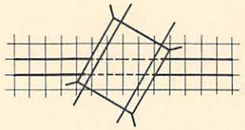
BASCULE
SINGLE LEAF

HIGHWAY CROSSINGS

PRIVATE ROAD
CROSSING

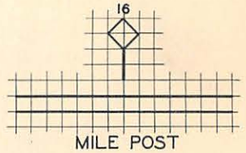
ROAD CROSSING
AT GRADE

ROAD CROSSING
UNDERGRADE



ROAD CROSSING
OVERHEAD

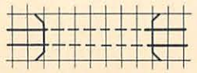
MAIL CRANE



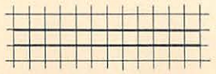
MILE POST

NOTE
SMALLER OR LARGER SYMBOLS MAY BE REQUIRED BUT PROPORTIONS SHOWN SHOULD BE USED EXCEPT WHEN IMPRACTICAL TO DO SO.

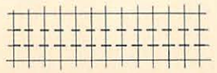
TRACKS



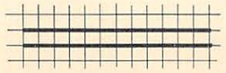
TUNNEL



TRACK TO REMAIN



TRACK TO BE TAKEN UP



PROPOSED
TRACKS

PROPOSED (FUTURE)
TRACKS

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SHEET 1 OF 10
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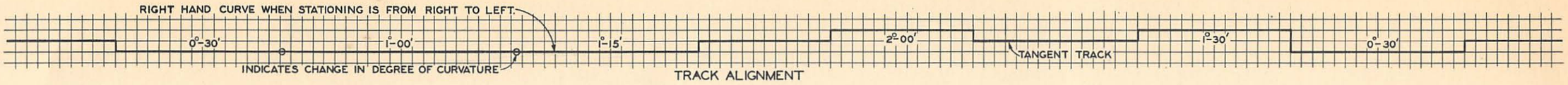
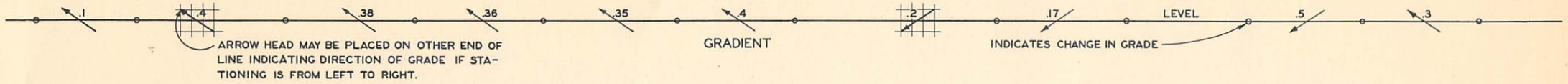


TRACK ALIGNMENT

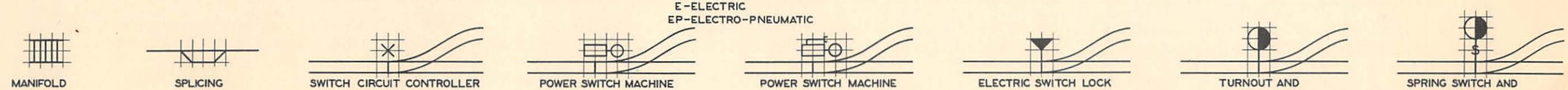


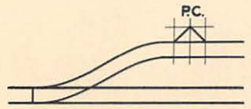
GRADIENT

RESERVOIRS

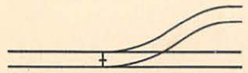
USE LETTER TO DENOTE TYPE OF SWITCH MACHINE

E-ELECTRIC
EP-ELECTRO-PNEUMATIC



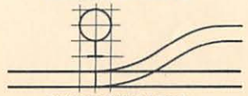


LIFTING BLOCK DERAIL
PIPE CONNECTED TO SWITCH



INSULATED SWITCH ROD

TYPE OF INDICATOR TO BE COVERED BY NOTE.



SWITCH INDICATOR

SEE NOTE ON SHEET 1

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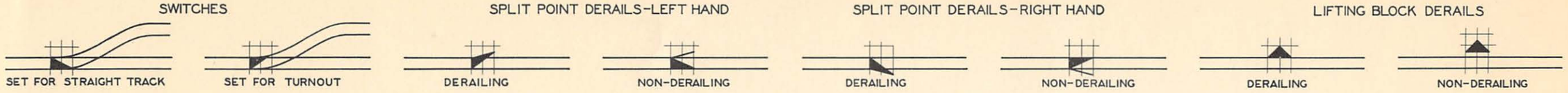
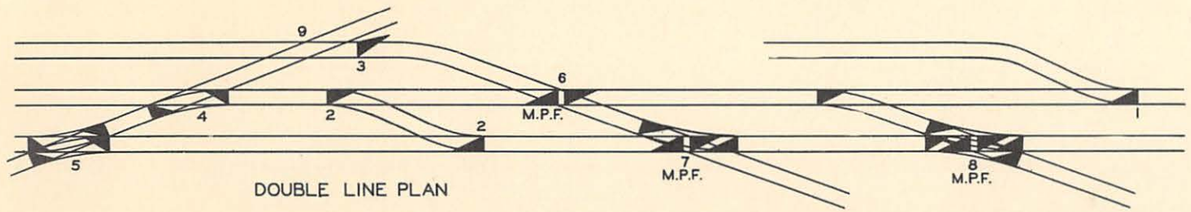
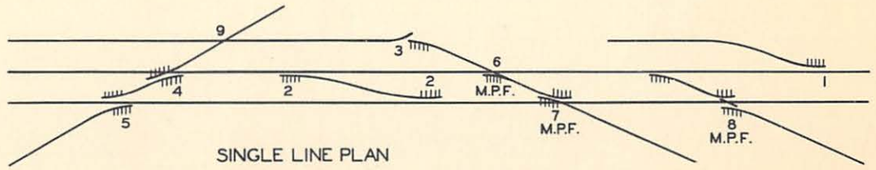
POSITION OF INTERLOCKING SWITCHES, DERAILS, M.P.F., AND SLIP SWITCHES.

NONINTERLOCKED FUNCTIONS SHALL BE SHOWN SAME AS INTERLOCKED FUNCTIONS EXCEPT SHADING IN TRIANGLES SHALL BE OMITTED.





DOUBLE LINE PLAN



SINGLE LINE PLAN

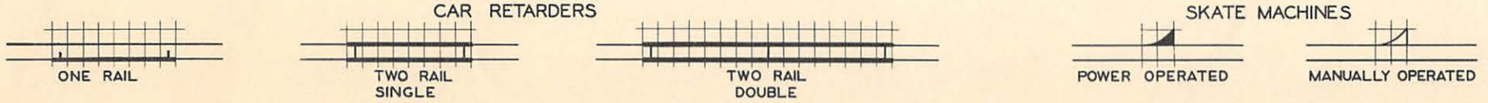
ABBREVIATIONS FOR OTHER SWITCH FUNCTIONS

S.L.M.-SWITCH AND LOCK MOVEMENT
B.L.-BOLT LOCK
F.P.L.-FACING POINT LOCK

REFERENCE EXPLANATION FOR SINGLE AND DOUBLE LINE PLANS

1. SIMPLE TURNOUT
2. SIMPLE CROSS-OVER
3. DERAIL-SINGLE POINT
4. SINGLE SLIP SWITCH
5. DOUBLE SLIP SWITCH
6. MOVABLE POINT CROSSING FROG (M.P.F.)
7. SINGLE SLIP SWITCH WITH M.P.F.
8. DOUBLE SLIP SWITCH WITH M.P.F.
9. RIGID CROSSING FROG.

SEE NOTE ON SHEET 1



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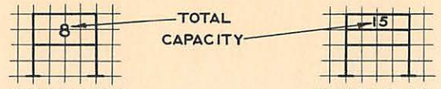
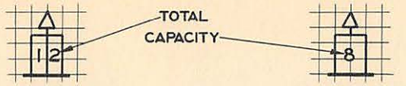


DOUBLE DOOR INSTRUMENT BOX

DOUBLE DOOR INSTRUMENT AND BATTERY BOX

SINGLE DOOR INSTRUMENT BOX

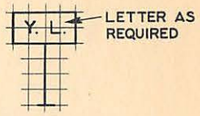


DOUBLE DOOR INSTRUMENT CASE

SINGLE DOOR INSTRUMENT CASE

INSTRUMENT AND BATTERY HOUSE

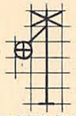
CABLE POST



ROADWAY SIGN

HIGHWAY CROSSING SIGNALS

AUDIBLE



THREE POSITION WIG-WAG

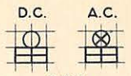
TWO POSITION

FOUNDATION MARKER OR FLOOD LIGHT.

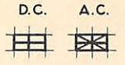
FLASHER

ILLUMINATED STOP SIGN.

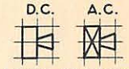
STOP ON RED SIGNAL, OR STOP WHEN SWINGING SIGN.



BELL

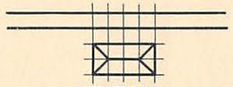


BUZZER



HORN OR WHISTLE

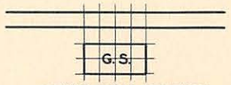
INTERLOCKING OR BLOCK STATIONS



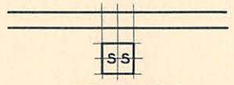
STATION

OPERATOR FACING TRACK

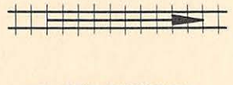
OPERATOR WITH BACK TO TRACK



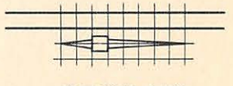
GENERATING STATION



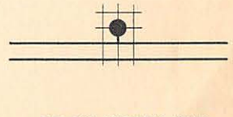
SUB-STATION



TRAFFIC DIRECTION



CROSSING GATE



TRACK INSTRUMENT LOCATION

SEE NOTE ON SHEET 1

BATTERY SHELTERS

TRUE MERIDIAN

POLE LINE

BATTERY CHUTE

BELOW SURFACE

HALF ABOVE SURFACE

TELEPHONE

JUNCTION BOX

TERMINAL OR TRANSFORMER BOX

LIGHTNING ARRESTER BOX.

MANHOLE

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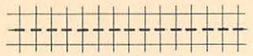
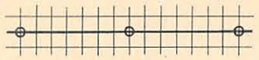
COMBINATIONS

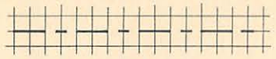
PIPE OR WIRE (MECHANICAL)



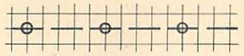
WIRE DUCT



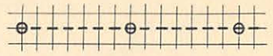
COMPRESSED AIR



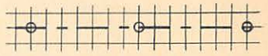
PIPE OR WIRE, AND DUCT



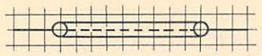
PIPE OR WIRE, AND AIR



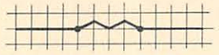
DUCT AND AIR



PIPE OR WIRE, DUCT, AND AIR



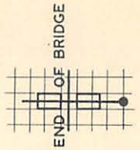
PIPE RUN THRU 2" PIPE



COMPENSATOR

ARROW INDICATES DIRECTION OF MOVEMENT FROM NORMAL TO REVERSE

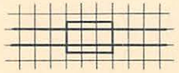
RAIL LOCKS



BRIDGE LOCK

MECHANICAL BRIDGE COUPLER

1 WAY



2 WAY

3 WAY

BOLT LOCKS

1 WAY

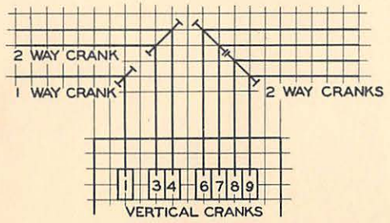
2 WAY

3 WAY

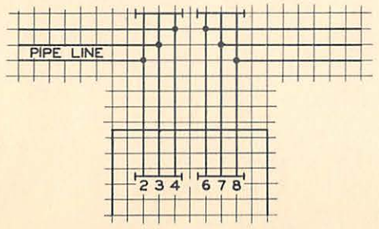
CRANKS

GROUND LEVERS

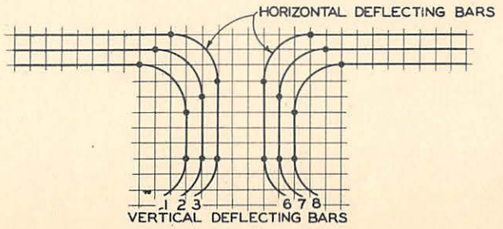
DWARF MACHINE



CRANK LEAD-OUT



ROCKING SHAFT LEAD-OUT



DEFLECTING BAR LEAD-OUT

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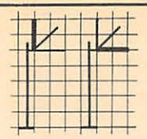
CHARACTERISTICS / POSITION OR EQUIVALENT	NON-AUTOMATIC	SEMI-AUTOMATIC		AUTOMATIC	SPECIAL, REQUIRES REFERENCE TO NOTES
		STICK	NON-STICK		
0° U.Q. 45°					
0° L.Q. 45°					
0° U.Q. 90°					
U.Q. 45° L.Q. 45°					
U.Q. 45° U.Q. 90°					
L.Q. 45° U.Q. 90°					
0° U.Q. 45° L.Q. 45°					
0° U.Q. 45° U.Q. 90°					
0° U.Q. 90° L.Q. 45°					
U.Q. 45° U.Q. 90° L.Q. 45°					
0° U.Q. 45° U.Q. 90° L.Q. 45°					

SIGNAL OPERATING CHARACTERISTICS



HEAVY LINE INDICATES NORMAL POSITION OR IT'S EQUIVALENT

ABBREVIATIONS

E- ELECTRIC SEMAPHORE
P- POSITION LIGHT
CP- COLOR POSITION LIGHT
M- MECHANICAL
C- COLOR LIGHT.

IF ABBREVIATION IS USED, PREFIX LETTER "A" TO INDICATE APPROACH LIGHTING.

EXPLANATORY DATA

3 POSITION
SEMI-AUTOMATIC STICK U.Q. 45° TO 90°
SEMI-AUTOMATIC NON-STICK 0° TO U.Q. 45°

4 POSITION
SEMI-AUTOMATIC STICK 0° TO U.Q. 45° TO 90°
SEMI-AUTOMATIC NON-STICK 0° TO L.Q. 45°

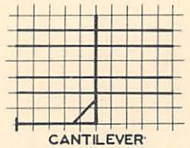
NON-OPERATING

DWARF SIGNAL

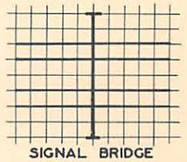
GROUND MAST

GROUND MAST WITH CANTILEVER ATTACHMENT

BRACKET POST



CANTILEVER SIGNAL BRIDGE



SIGNAL BRIDGE

MARKERS, CONTINUOUS LIGHT

NON-STICK

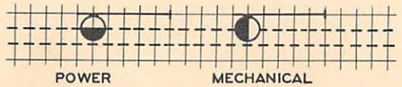
STICK

MARKERS, NONCONTINUOUS LIGHT

NON-STICK

STICK

RELATION OF SIGNAL TO THE TRACK AND DIRECTION OF TRAFFIC



POWER MECHANICAL

SMASH BOARD SIGNALS

SEE NOTE ON SHEET 1

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THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT AND GENERAL MANAGER			
ERIE RAILROAD COMPANY — VICE PRESIDENT			
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT			
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT			
K.L.M.	C.D.M.	A.J.P.	
K.L.M.			

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APPROVED: MAY 17, 1932.
CHIEF ENGINEER

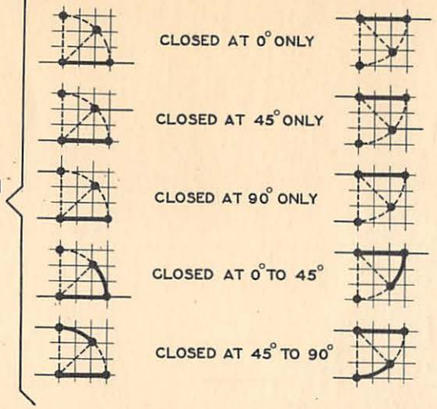
SHEET 6 OF 10

S-2986

CIRCUIT CONTROLLERS OPERATED BY SIGNALS

UPPER QUADRANT — LOWER QUADRANT

3 POSITION SIGNALS

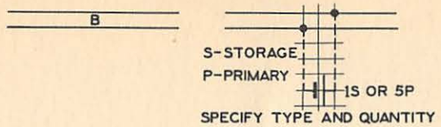


- CLOSED AT 0° ONLY
- CLOSED AT 45° ONLY
- CLOSED AT 90° ONLY
- CLOSED AT 0° TO 45°
- CLOSED AT 45° TO 90°

60°, 70°, OR 75° SIGNALS

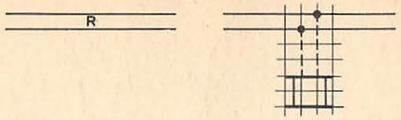
- CLOSED AT 0° ONLY
- CLOSED IN CLEAR POSITION ONLY

TRACK BATTERY

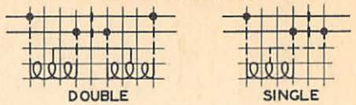


SPECIFY TYPE AND QUANTITY

TRACK RELAY

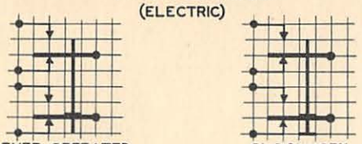


IMPEDANCE BONDS



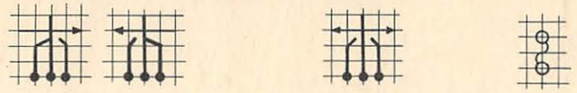
DOUBLE — SINGLE

TIME RELEASES (ELECTRIC)

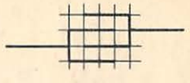


LEVER OPERATED — CLOCKWORK

TRACK INSTRUMENT CONTACTS



DIRECTIONAL — NON-DIRECTIONAL — FUSE

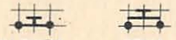


CAPACITOR OR CONDENSER

FLOOR PUSH

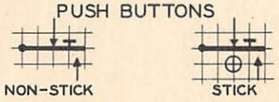
LATCH CONTACT

FUSED CUT-OUT

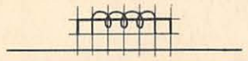


CLOSED — OPEN

PUSH BUTTONS



NON-STICK — STICK

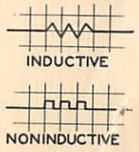


LIVE INDUCTOR

DEAD INDUCTOR LOCATION

SEE NOTE ON SHEET 1

FIXED RESISTOR



INDUCTIVE — NONINDUCTIVE — IMPEDANCE WITHOUT IRON CORE

VARIABLE RESISTOR

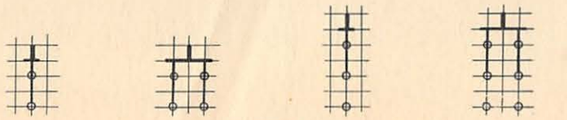
INDUCTIVE — NONINDUCTIVE — IMPEDANCE WITH IRON CORE

AIR BREAK SWITCHES

SINGLE THROW — DOUBLE THROW

SINGLE POLE — DOUBLE POLE — SINGLE POLE — DOUBLE POLE

OPEN



CLOSED

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K.L.M.		

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APPROVED BY
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APPROVED: [signature] CHIEF ENGINEER — MAY 17, 1932.

SHEET 7 OF 10

S-2986

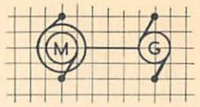
D. C. MOTOR

D. C. GENERATOR

A.C. MOTOR

A.C. GENERATOR

D.C.-D.C. MOTOR GENERATOR



A.C.-D.C. MOTOR GENERATOR

USE LETTER FOR COLOR WHEN OTHER THAN WHITE COVER GLASS IS USED. G- GREEN, Y- YELLOW, R- RED, P- PURPLE.

AMMETER

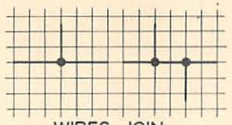
VOLTMETER

WATTMETER

ELECTRIC LAMP OR BULL'S EYE

LIGHTNING ARRESTER

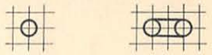
WIRES CROSS



WIRES JOIN

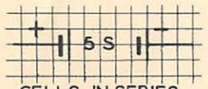
GROUND

TERMINALS



SINGLE DOUBLE

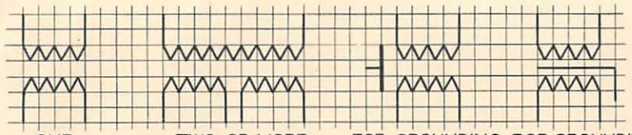
CELLS IN MULTIPLE



CELLS IN SERIES

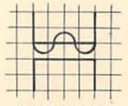
SPECIFY TYPE AND NUMBER OF CELLS
D- DRY BATTERY G- GRAVITY BATTERY
P- POTASH BATTERY S- STORAGE BATTERY
EXAMPLES- 16P, 10S, ETC.

TRANSFORMERS

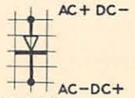


ONE SECONDARY TWO OR MORE SECONDARIES FOR GROUNDING CASE FOR GROUNDING SHIELD

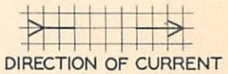
RECTIFIERS



BATTERY CHARGER



VALVE

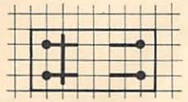


DIRECTION OF CURRENT

SWITCH CIRCUIT CONTROLLER CONTACTS

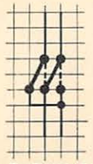
3 POSITION

2 POSITION

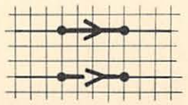


CIRCUIT CONTROLLER OPERATED BY LOCKING MECHANISM OF A SWITCH MOVEMENT

TOWER OR APPARATUS HOUSING WALL



POLE CHANGING CIRCUIT CONTROLLER



BRIDGE CIRCUIT CONTROLLER

SEE NOTE ON SHEET 1

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APPROVED: W. Winchell CHIEF ENGINEER MAY 17, 1932.

SHEET 8 OF 10
S-2986

D.C. ELECTRO-MAGNET

A.C. ELECTRO-MAGNET

COIL ENERGIZED
OR DE-ENERGIZED

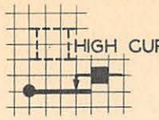
NEUTRAL FRONT CONTACT
CLOSED OR OPEN

NEUTRAL BACK CONTACT
CLOSED OR OPEN

POLARIZED ARMATURE WITH
CONTACTS, NORMAL POSITION

THREE POSITION ARMATURE
WITH CONTACTS, NORMAL POSITION

BACK CONTACT MAKES
BEFORE FRONT CONTACT
BREAKS



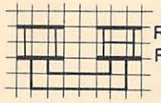
HIGH CURRENT CONTACT

DOUBLE WINDING RELAY
SPECIFY IF DIFFERENTIAL

SLOW RELEASE RELAY

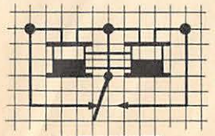
SLOW PICK-UP RELAY

COMBINED SLOW RELEASE
AND SLOW PICK-UP RELAY



RETAINED-NEUTRAL
POLARIZED RELAY

FLASHER RELAY

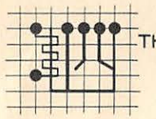


WIRING OF
FLASHER RELAY

FLASHER RELAY
CONTACT, RELAY
DE-ENERGIZED.

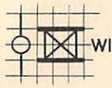
TIME ELEMENT RELAY

THERMAL RELAY

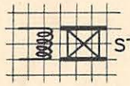


THERMAL RELAY
CONTACTS

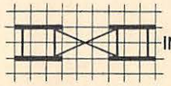
BANK OF CODING
RELAYS



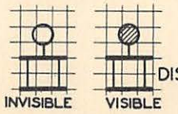
WIRE WOUND ROTOR



STATIONARY WINDING

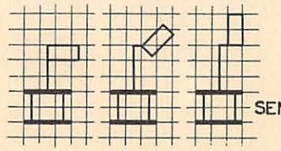


INTERLOCKING RELAY



INVISIBLE VISIBLE

DISC TYPE INDICATOR

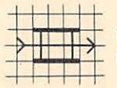


SEMAPHORE TYPE
INDICATOR

ELECTRIC LOCK
SHOW KEY LETTERS
INDICATING FUNCTION
OF LOCK.

N= NORMAL LOCK
R= REVERSE LOCK
B= NORMAL INDICATION LOCK, 2 POSITION LEVER OR
LEFT INDICATION LOCK, 3 POSITION LEVER.
D= REVERSE INDICATION LOCK, 2 POSITION LEVER OR
RIGHT INDICATION LOCK, 3 POSITION LEVER.

QUICK RELEASE RELAY



POLARIZED RELAY WITH
NEUTRALIZING COILS

SEE NOTE ON SHEET 1

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VICE PRESIDENT

C. H. W.	C. D. M.	A. J. P.
C. H. W.		

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APPROVED: MAY 17, 1932.
CHIEF ENGINEER

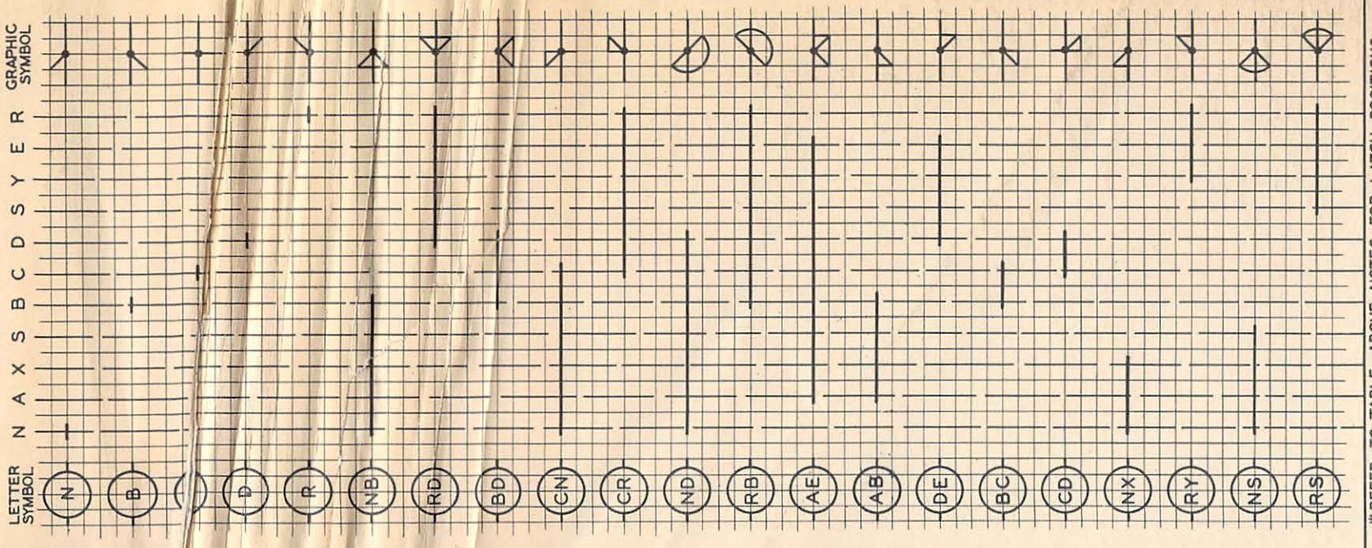
SHEET 9 OF 10

S-2986

CIRCUIT CONTROLLER CONTACT CHART

CONTROLLER OPERATED BY LEVER OR LATCH.
LEVERS WITH EXTREME END POSITION AS NORMAL.
*LEVER POSITIONS.

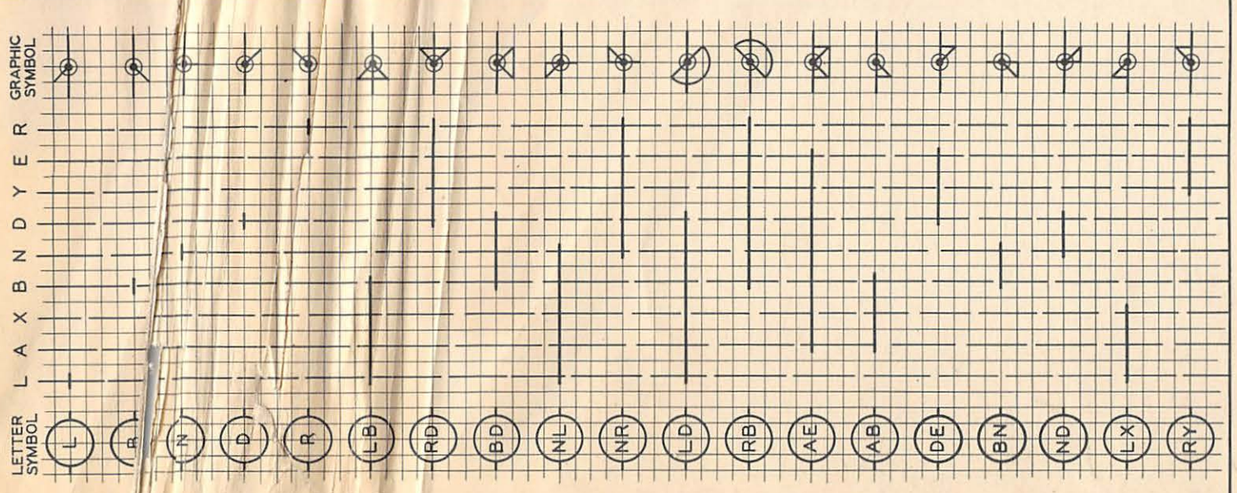
N – FULL NORMAL POSITION OF LEVER.
B – NORMAL INDICATION POSITION.
C – CENTRAL POSITION.
D – REVERSE INDICATION POSITION.
R – FULL REVERSE POSITION.



*REFER TO TABLE ABOVE NOTES FOR LATCH POSITIONS OF MECHANICAL INTERLOCKING MACHINES.

CONTROLLER OPERATED BY LEVER.
LEVERS WITH MIDDLE POSITON AS NORMAL.
LEVER POSITIONS.

N – NORMAL POSITION.
L – FULL REVERSE POSITION TO THE LEFT.
B – INDICATION POSITION TO THE LEFT.
D – INDICATION POSITION TO THE RIGHT.
R – FULL REVERSE POSITION TO THE RIGHT.



MECHANICAL INTERLOCKING MACHINE
CIRCUIT CONTROLLERS OPERATED BY LATCH

N – FULL NORMAL POSITION OF LEVER, LATCH DOWN.
A – LATCH RAISED 1/8" FROM NORMAL POSITION.
X – " " 1/3 WAY OUT OF NORMAL CATCH.
S – " " 1/2 " " " " "
B – " " 2/3 " " " " "
C – " " FULL " " " " "
D – " " 2/3 " " " REVERSE "
S – " " 1/2 " " " " "
Y – " " 1/3 " " " " "
E – " " 1/8" FROM REVERSE POSITION.
R – FULL REVERSE POSITION OF LEVER, LATCH DOWN.

ANY ADJUSTMENT SHOWN CAN BE USED ON ANY LEVER.
TRAVEL OF LATCH = 3/4"

NOTES

1. LETTER SYSTEM TO BE USED ON CIRCUIT PLANS, GRAPHIC SYSTEM SHOWN ONLY FOR INFORMATION.
2. HEAVY HORIZONTAL LINES INDICATE THE PORTION OF CYCLE OF LEVER THROUGH WHICH CIRCUIT IS CLOSED.

SEE NOTE ON SHEET 1

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
VICE PRESIDENT AND GENERAL MANAGER

ERIE RAILROAD COMPANY
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

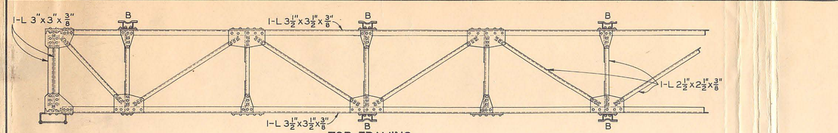
C. S. L.	C. D. M.	A. J. P.
C. S. L.		

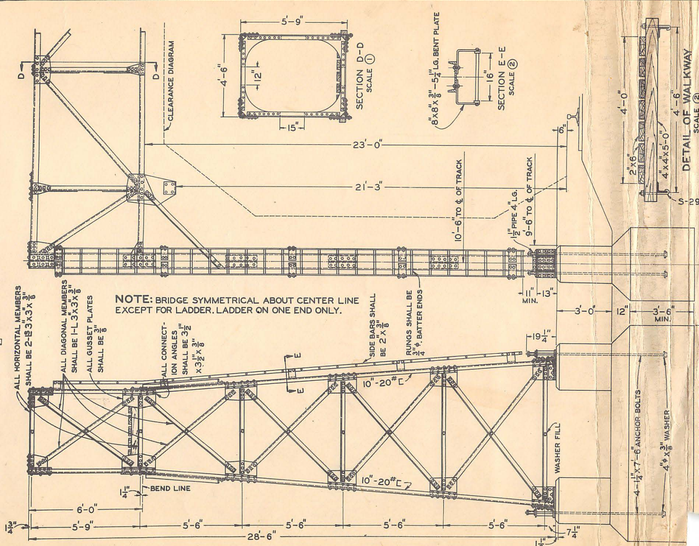
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

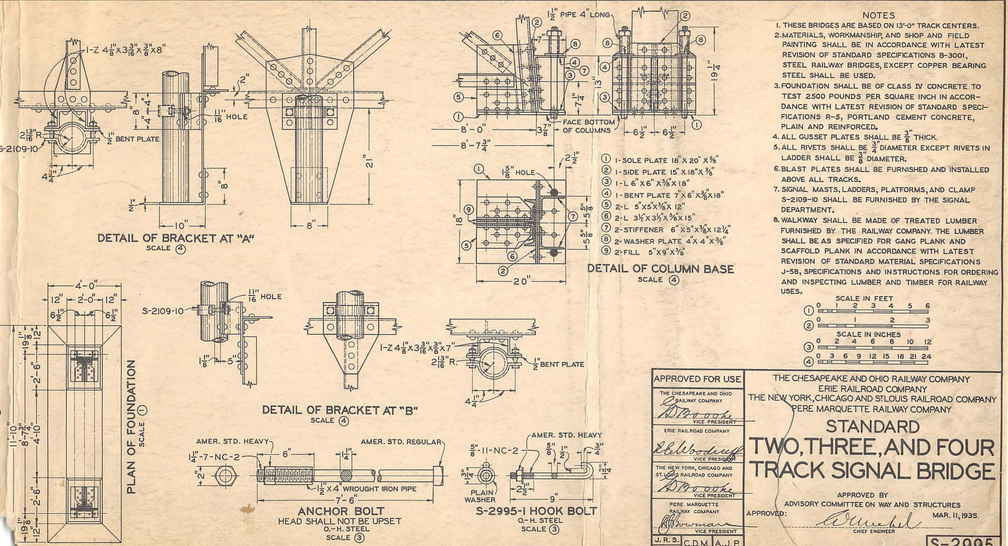
STANDARD SYMBOLS FOR SIGNAL PLANS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: MAY 17, 1932.
CHIEF ENGINEER

SHEET 10 OF 10
S-2986







NOTES

1. THESE BRIDGES ARE BASED ON 13'-0" TRACK CENTERS.
2. MATERIALS, WORKMANSHIP, AND SHOP AND FIELD PAINTING SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS B-3001, STEEL RAILWAY BRIDGES, EXCEPT COPPER BEARING STEEL SHALL BE USED.
3. FOUNDATION SHALL BE OF CLASS IV CONCRETE TO TEST 2,500 POUNDS PER SQUARE INCH IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS R-5, PORTLAND CEMENT CONCRETE, PLAIN AND REINFORCED.
4. ALL GUSSET PLATES SHALL BE 5/16" THICK.
5. ALL RIVETS SHALL BE 3/4" DIAMETER EXCEPT RIVETS IN LADDER SHALL BE 5/8" DIAMETER.
6. BLAST PLATES SHALL BE FURNISHED AND INSTALLED ABOVE ALL TRACKS.
7. SIGNAL MASTS, LADDERS, PLATFORMS, AND CLAMP S-2109-10 SHALL BE FURNISHED BY THE SIGNAL DEPARTMENT.
8. WALKWAY SHALL BE MADE OF TREATED LUMBER FURNISHED BY THE RAILWAY COMPANY. THE LUMBER SHALL BE AS SPECIFIED FOR GANG PLANK AND SCAFFOLD PLANK IN ACCORDANCE WITH LATEST REVISION OF STANDARD MATERIAL SPECIFICATIONS J-58, SPECIFICATIONS AND INSTRUCTIONS FOR ORDERING AND INSPECTING LUMBER AND TIMBER FOR RAILWAY USES.

SCALE IN FEET
SCALE IN INCHES

APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY	E. T. Wood, VICE PRESIDENT
ERIE RAILROAD COMPANY	H. Helbodwig, VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY	E. T. Wood, VICE PRESIDENT
PERE MARQUETTE RAILWAY COMPANY	[illegible], VICE PRESIDENT
J.R.S. / C.B.P.	C.D.M. / A.J.P.

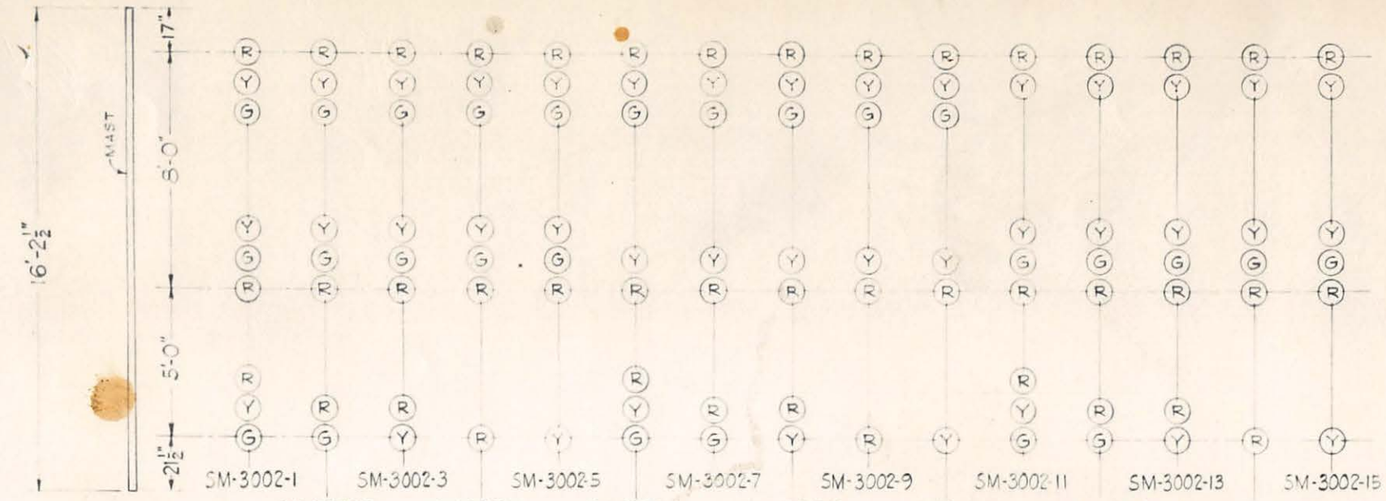
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD TWO, THREE, AND FOUR TRACK SIGNAL BRIDGE

APPROVED BY ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: [signature], CHIEF ENGINEER MAR. 11, 1935.

S-2995

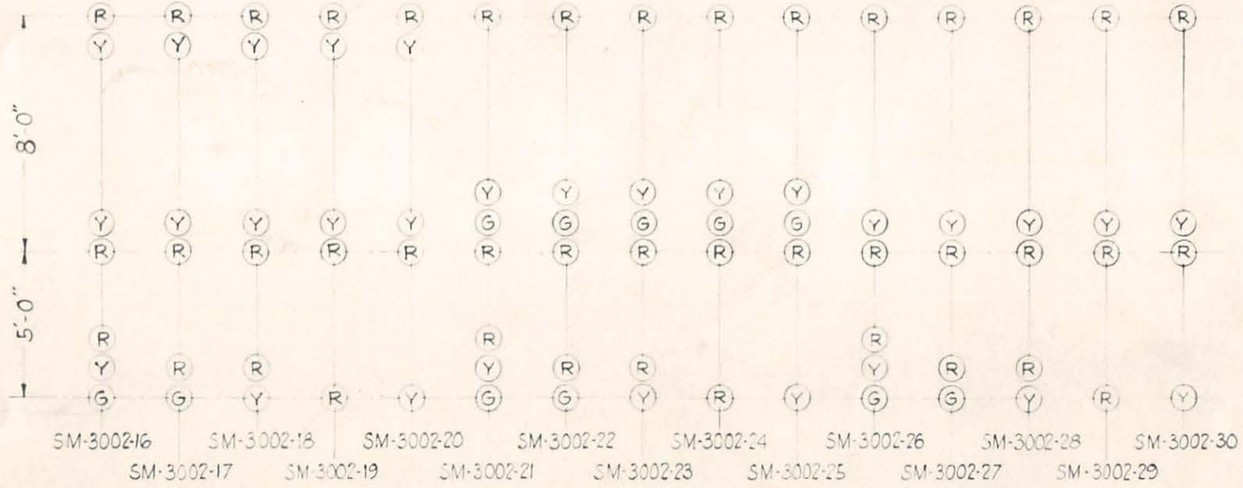


NOTES

1. SIGNAL SHALL BE SIMILAR TO DRAWING S-2104A EXCEPT MAST TO BE 16'-2½", WITH STYLE R-2 UNITS SPACED AS SHOWN. COMPLETE WITH LADDER FOR TOP UNIT, PLATFORMS, PINNACLE, MAST AND UNITS, WITHOUT LAMPS.

2. EACH SINGLE COLOR LIGHT UNIT SHALL BE FURNISHED WITH BACKGROUND FOR TWO COLOR UNIT WITH EXTRA HOLE BLANKED.

THREE UNIT TRUSS BRIDGE SIGNALS



TENTATIVE

NO SCALE

REVISIONS

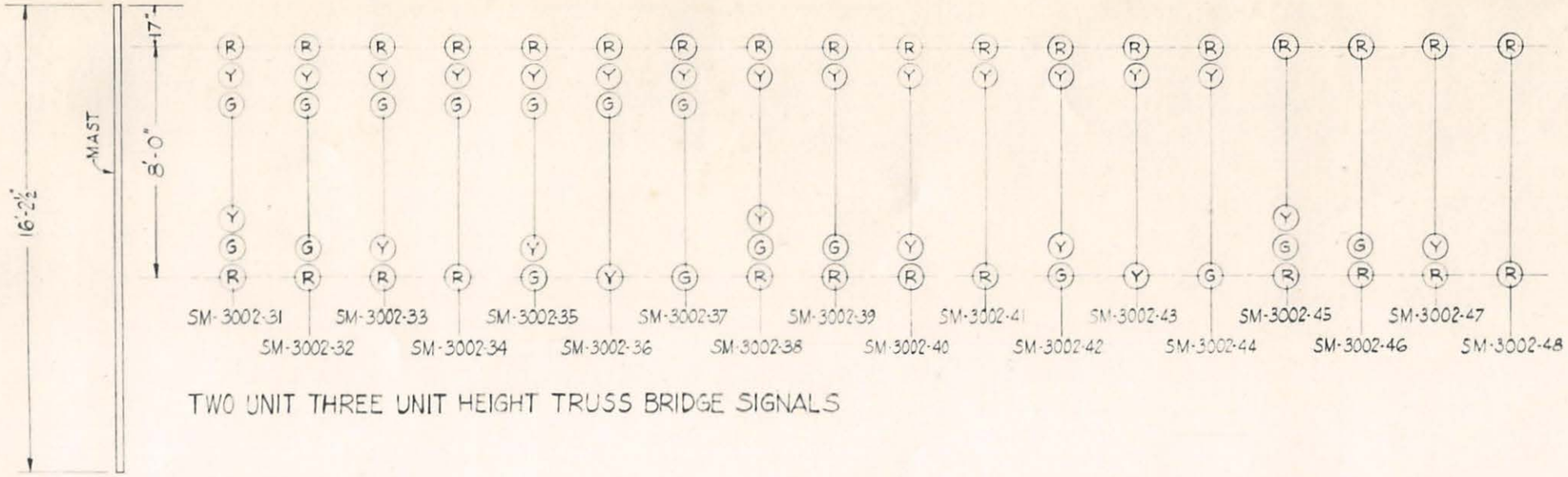
D.H.	U.H.A.	
D.H.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
OFFICE SUPERINTENDENT OF SIGNALS - RICHMOND, VIRGINIA.

COLOR LIGHT TRUSS BRIDGE SIGNAL, THREE UNIT HEIGHT MAST

APPROVED
SUPERINTENDENT OF SIGNALS
JUNE 1957

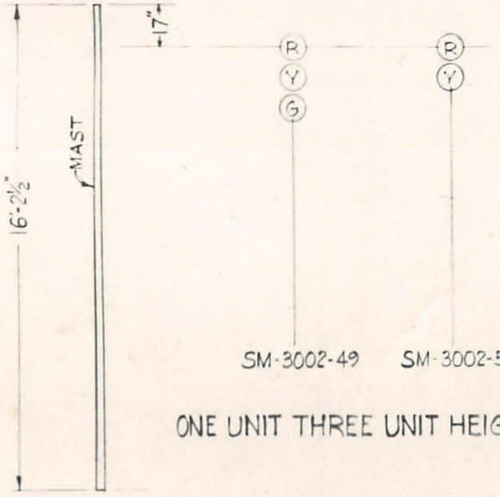
SHEET 1
CONT. ON SHEET 2



TWO UNIT THREE UNIT HEIGHT TRUSS BRIDGE SIGNALS

NOTES

1. SIGNAL SHALL BE SIMILAR TO DRAWING S-2104A EXCEPT MAST TO BE 16'-2½", WITH STYLE R-2 UNITS SPACED AS SHOWN. COMPLETE WITH LADDER FOR TOP UNIT, PLATFORMS, PINNACLE, MAST AND UNITS, WITHOUT LAMPS. FOR USE WHERE ONE OR TWO UNIT SIGNAL IS TO BE MOUNTED ON SAME SIDE OF BRIDGE WITH THREE UNIT SIGNAL.
2. EACH SINGLE COLOR LIGHT UNIT SHALL BE FURNISHED WITH BACK GROUND FOR TWO COLOR UNIT WITH EXTRA HOLE BLANKED.



ONE UNIT THREE UNIT HEIGHT TRUSS BRIDGE SIGNALS

TENTATIVE

NO SCALE

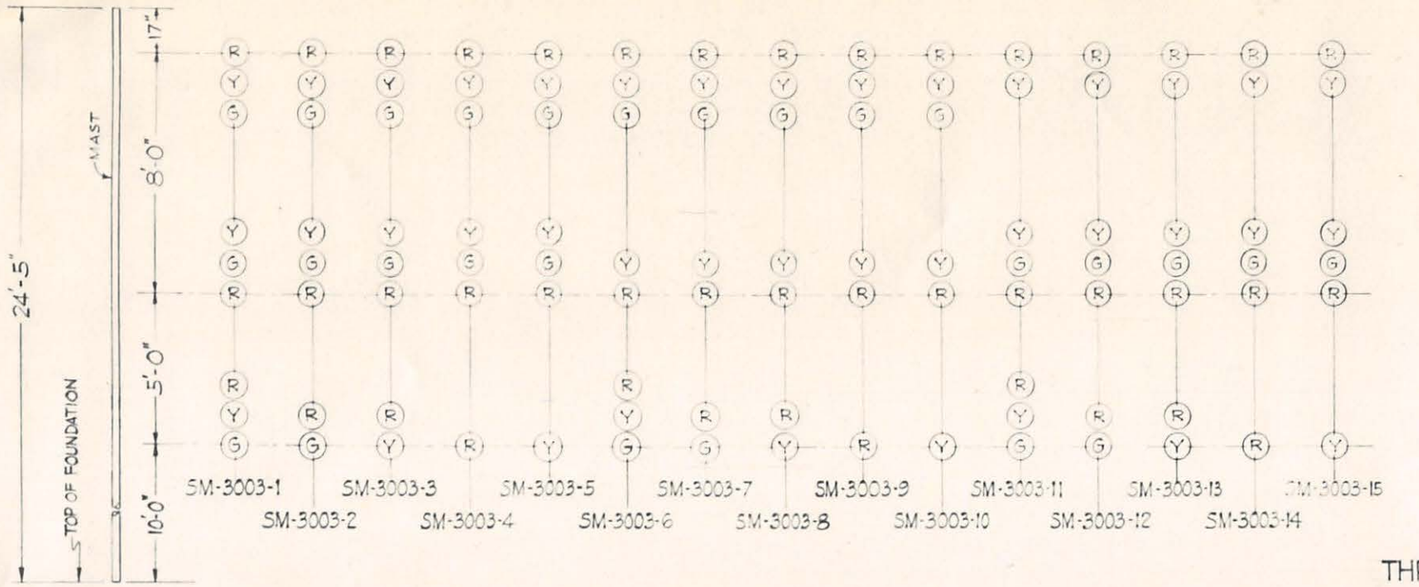
REVISIONS		
D.H.	U.H.A.	
D.H		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
OFFICE SUPERINTENDENT OF SIGNALS - RICHMOND, VIRGINIA.

COLOR LIGHT TRUSS BRIDGE SIGNAL, THREE UNIT HEIGHT MAST

APPROVED
SUPERINTENDENT OF SIGNALS
JUNE 1957

SHEET 2
SM-3002

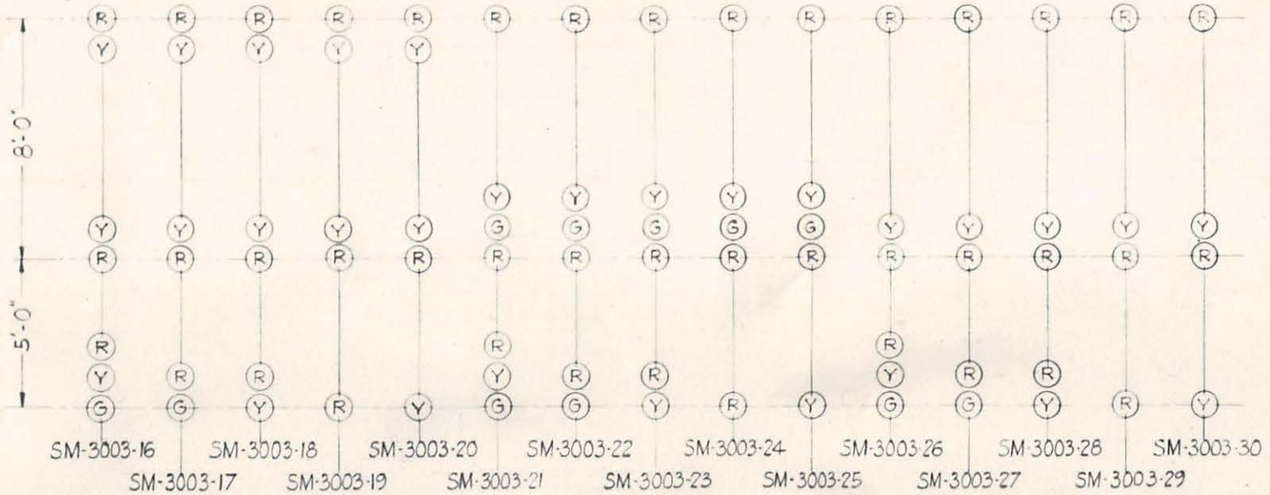


NOTES

1. SIGNAL SHALL BE SIMILAR TO DRAWING S-2102 EXCEPT MAST TO BE 24'-5" WITH STYLE R-2 UNITS SPACED AS SHOWN. COMPLETE WITH LADDER AND PLATFORMS, PINNACLE, MAST AND UNITS, WITHOUT LAMPS AND FOUNDATION BOLTS.

2. EACH SINGLE COLOR LIGHT UNIT SHALL BE FURNISHED WITH BACKGROUND FOR TWO COLOR UNIT WITH EXTRA HOLE BLANKED.

THREE UNIT GROUND SIGNALS



TENTATIVE

NO SCALE

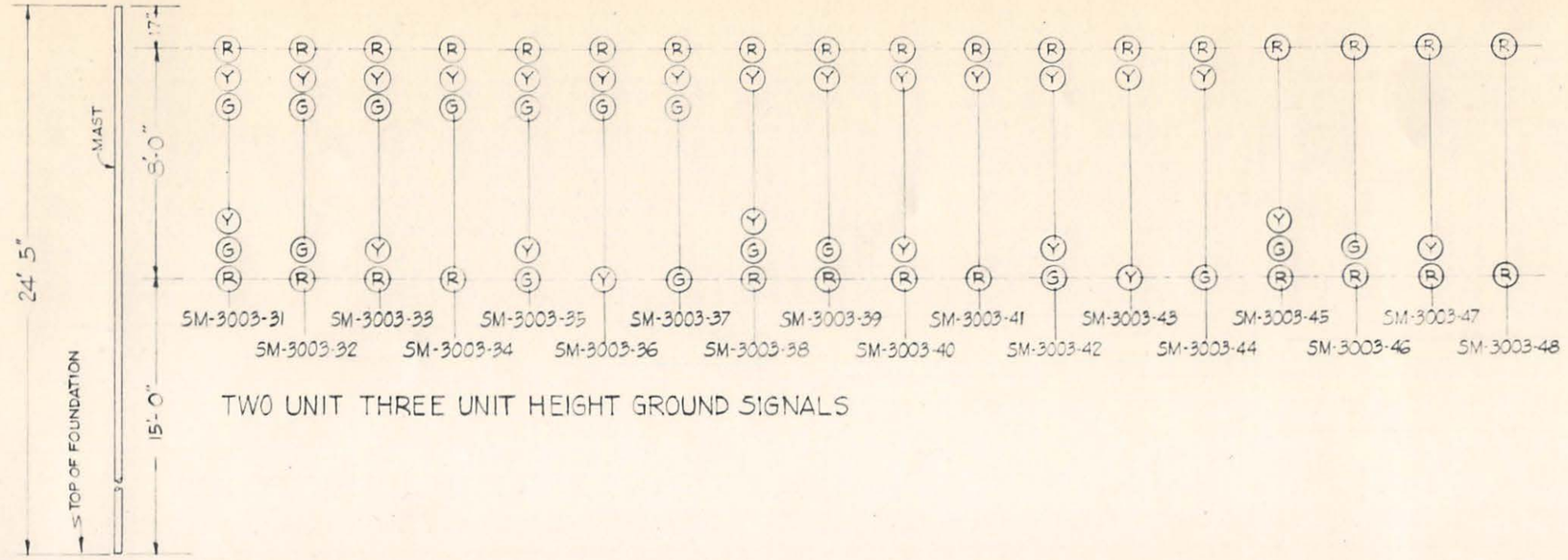
REVISIONS		
D.H.	U.H.A	
D.H.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
OFFICE SUPERINTENDENT OF SIGNALS - RICHMOND, VIRGINIA.

COLOR LIGHT GROUND SIGNAL, THREE UNIT HEIGHT MAST

APPROVED.....
SUPERINTENDENT OF SIGNALS
JUNE 1957

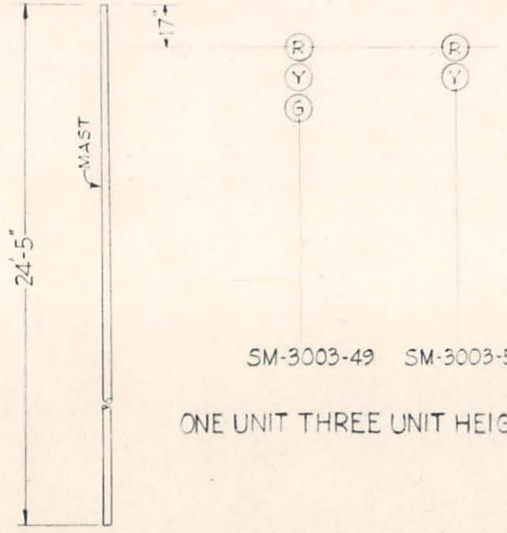
SHEET 1
CONT. ON SHEET 2
SM-3003



TWO UNIT THREE UNIT HEIGHT GROUND SIGNALS

NOTES

1. SIGNAL SHALL BE SIMILAR TO DRAWING S-2102 EXCEPT MAST TO BE 24'-5" WITH STYLE R-2 UNITS SPACED AS SHOWN. COMPLETE WITH LADDER AND PLATFORMS, PINNACLE, MAST AND UNITS, WITHOUT LAMPS AND FOUNDATION BOLTS.
2. EACH SINGLE COLOR LIGHT UNIT SHALL BE FURNISHED WITH BACKGROUND FOR TWO COLOR UNIT WITH EXTRA HOLE BLANKED.



ONE UNIT THREE UNIT HEIGHT GROUND SIGNALS

TENTATIVE

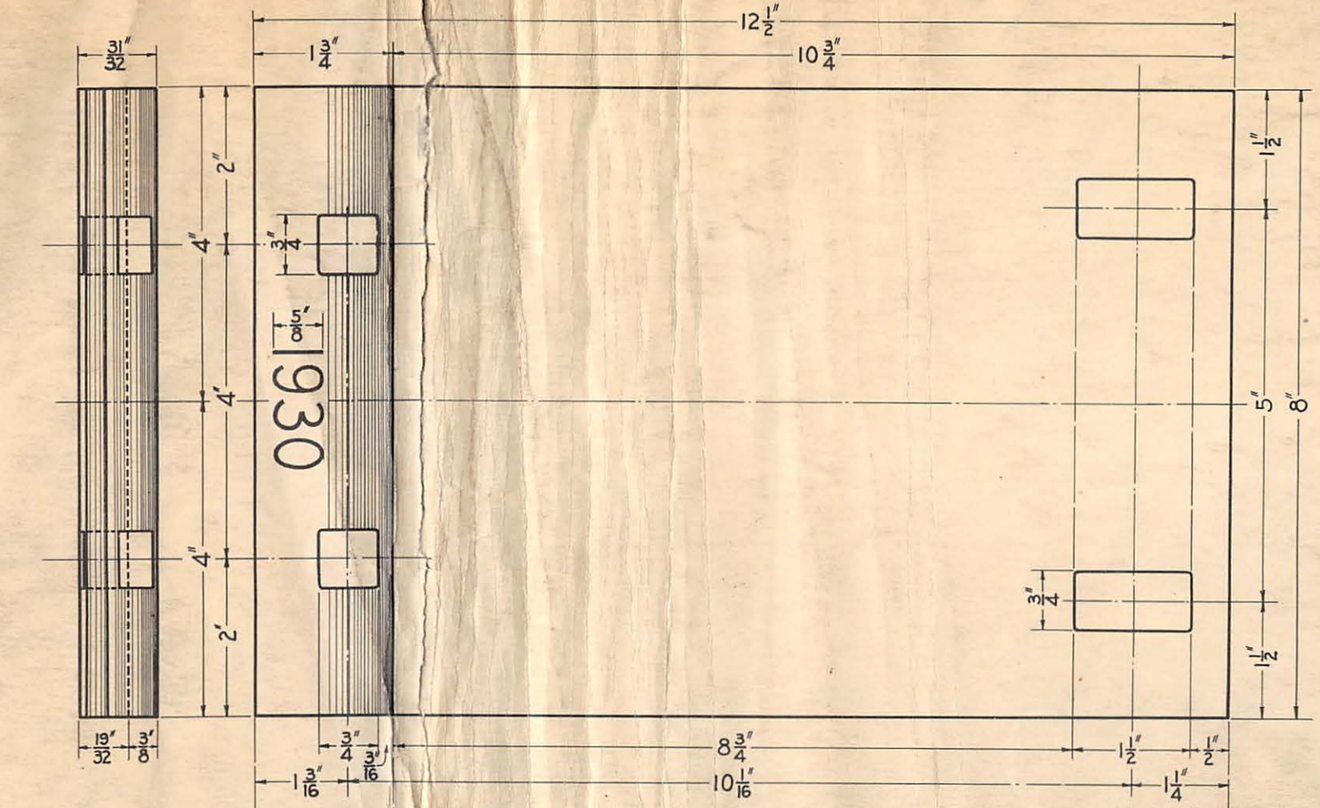
NO SCALE

REVISIONS		
D.H.	U.H.A	
D.H.		

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
OFFICE SUPERINTENDENT OF SIGNALS - RICHMOND, VIRGINIA

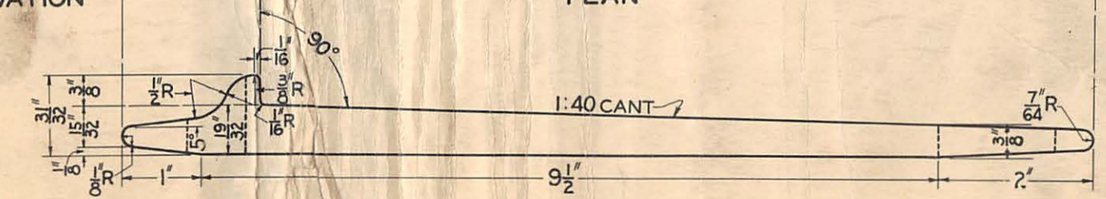
COLOR LIGHT GROUND SIGNAL, THREE UNIT HEIGHT MAST

APPROVED
SUPERINTENDENT OF SIGNALS
JUNE 1957



END ELEVATION

PLAN



SIDE ELEVATION

SCALE ①

WEIGHT 12.53 LBS.

NOTES:-

YEAR OF MANUFACTURE SHALL BE ROLLED IN FIVE-EIGHTHS INCH RAISED FIGURES AS INDICATED.
SHOP MARKS TO BE PLACED IN THE CORNERS ON SHOULDER SIDE OF PLATE.
A TOLERANCE OF THREE PERCENT OVER OR UNDER WEIGHT SHOWN WILL BE ALLOWED.
MATERIAL TO CONFORM TO LATEST REVISION OF STANDARD SPECIFICATIONS R-6, STEEL TIE PLATES.

SCALE IN INCHES
① 0 1 2

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY G D Brooke VICE PRESIDENT		
ERIE RAILROAD COMPANY R E Woodruff VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY H H Klein VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY O J Bowman VICE PRESIDENT		
D.L.A. J.R.S.	W.S.E.	J.R.S.

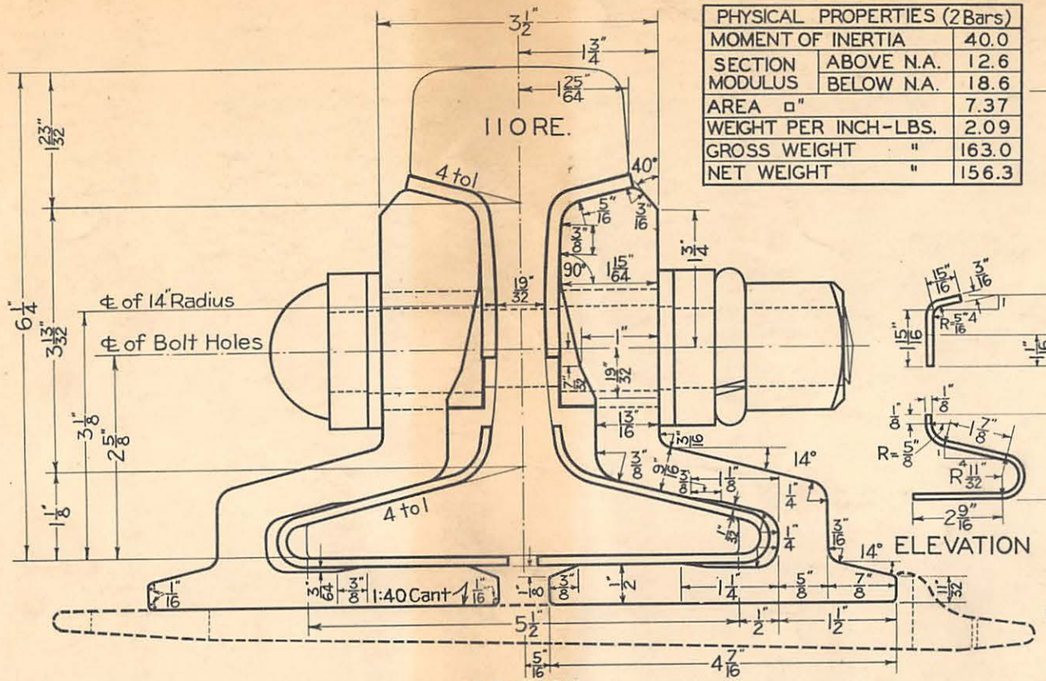
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD ABRASION PLATE FOR 110 LB. RE AND 130 LB. RE INSULATED RAIL JOINTS

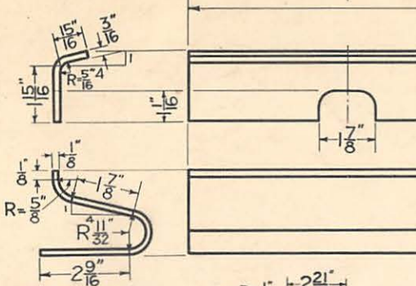
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: W M Kinsel, CHIEF ENGINEER DEC. 16, 1930

R-520

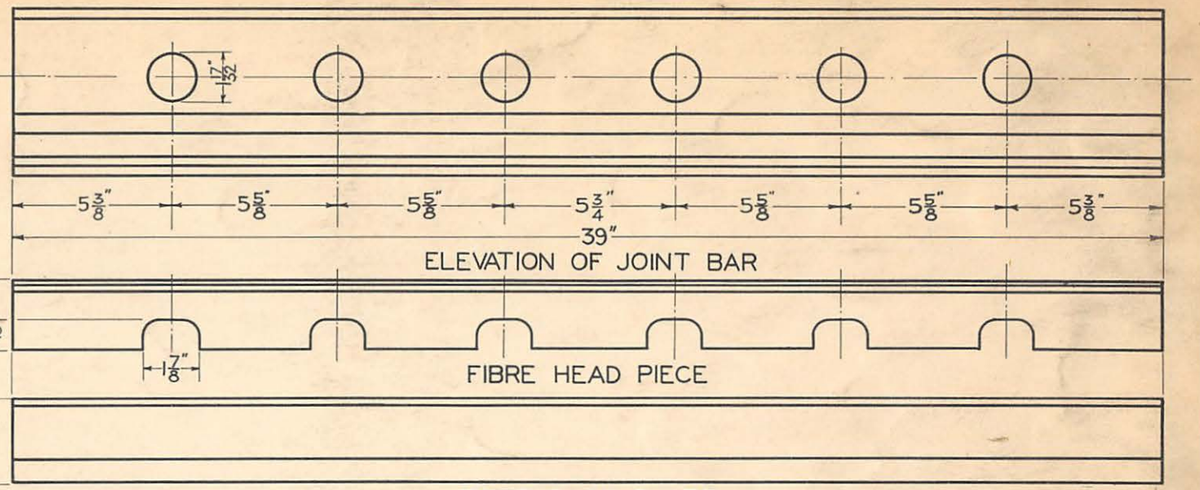
PHYSICAL PROPERTIES (2 Bars)		
MOMENT OF INERTIA		40.0
SECTION MODULUS	ABOVE N.A.	12.6
	BELOW N.A.	18.6
AREA □"		7.37
WEIGHT PER INCH-LBS.		2.09
GROSS WEIGHT	"	163.0
NET WEIGHT	"	156.3



SECTION
Scale ①



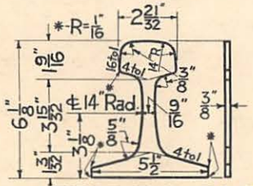
ELEVATION



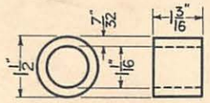
ELEVATION OF JOINT BAR

FIBRE HEAD PIECE

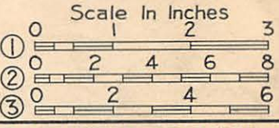
FIBRE BASE PLATE
Scale ②

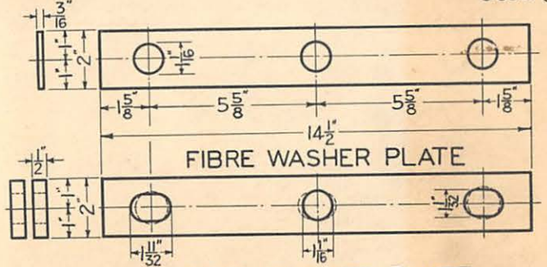


FIBRE END POST
No Scale



FIBRE BUSHING
Scale ③

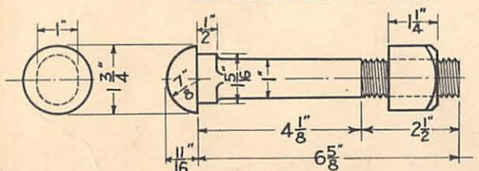




STEEL WASHER PLATE
Scale ②

Steel washer plates punched in pairs as indicated by full and dotted lines.
Wt. Plate-2-Ellip. holes 3.666 #
Wt. Plate-1-Ellip. hole 3.687 #

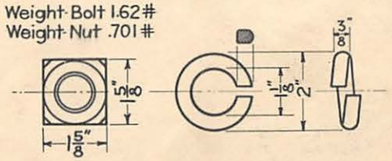
Bolt to have U.S. Standard cut threads and to be heat treated.



INSULATED JOINT BOLT
Scale ③

NOTE:-
FOR ABRASION PLATE SEE DRAWING R-520.

Weight Bolt 1.62 #
Weight Nut .701 #



SPRING WASHER
(Of approved design)
Scale ③

APPROVED FOR USE		
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT		
ERIE RAILROAD COMPANY — VICE PRESIDENT		
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — VICE PRESIDENT		
PERE MARQUETTE RAILWAY COMPANY — VICE PRESIDENT		
D.L.A.	D.L.A.	W.S.E.

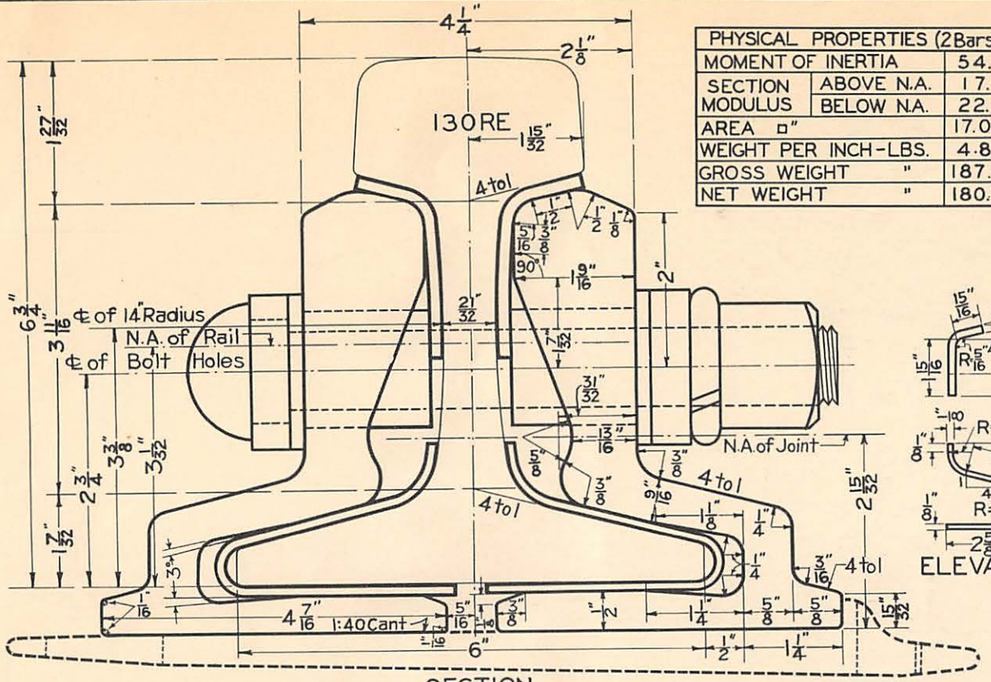
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD 110 LB. RE. INSULATED RAIL JOINT

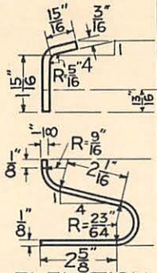
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED DEC. 16, 1930
CHIEF ENGINEER

R-521

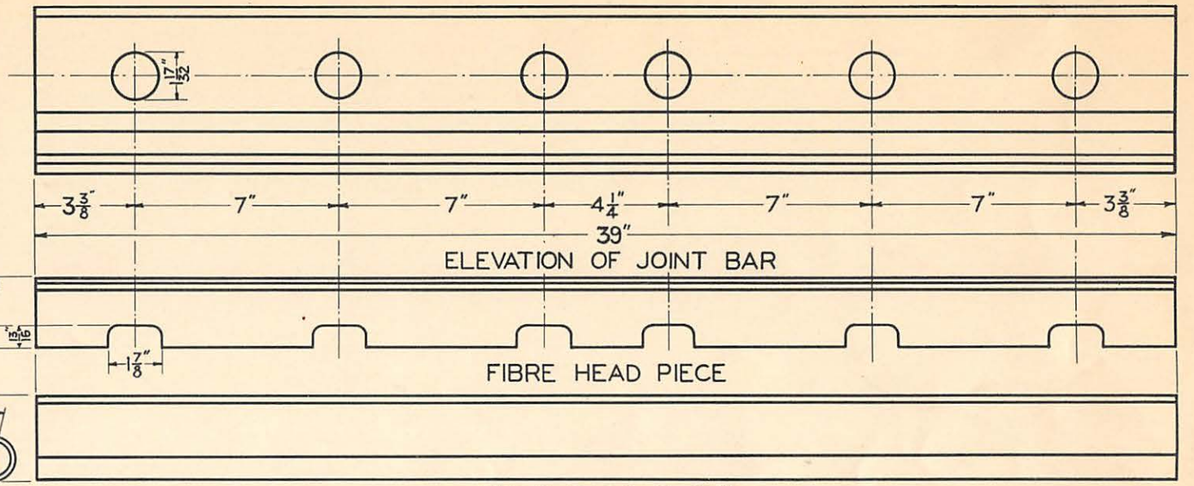
PHYSICAL PROPERTIES (2 Bars)		
MOMENT OF INERTIA		54.9
SECTION MODULUS	ABOVE N.A.	17.0
	BELOW N.A.	22.3
AREA □"		17.00
WEIGHT PER INCH-LBS.		4.82
GROSS WEIGHT	"	187.9
NET WEIGHT	"	180.0



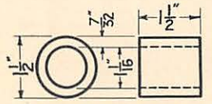
SECTION
Scale ①



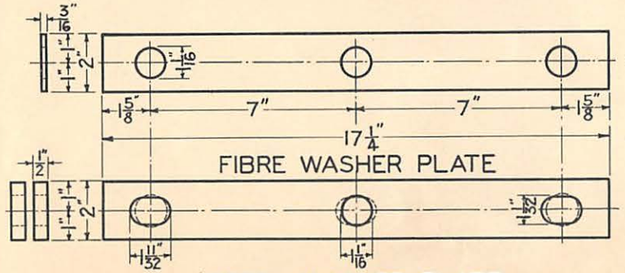
ELEVATION



FIBRE BASE PLATE
Scale ②



FIBRE BUSHING
Scale ③

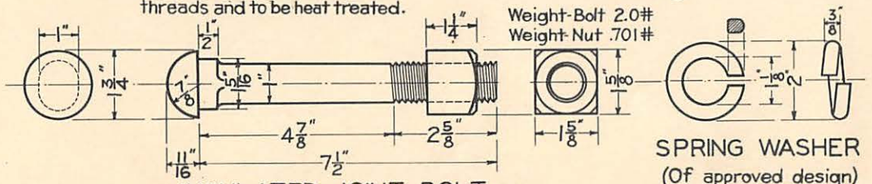


STEEL WASHER PLATE
Scale ②

Steel washer plates punched in pairs as indicated by full and dotted lines.
Wt-Plate-2-Ellip. holes 4.446#
Wt-Plate-1-Ellip. hole 4.477#

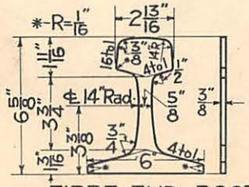
Bolt to have U.S. Standard cut threads and to be heat treated.

Weight-Bolt 2.0#
Weight-Nut .701#



INSULATED JOINT BOLT
Scale ③

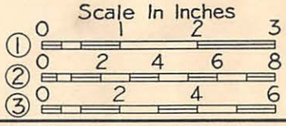
SPRING WASHER
(Of approved design)
Scale ③



FIBRE END POST
No Scale

NOTE:-
FOR ABRASION PLATE SEE DRAWING R-520.

Scale In Inches



APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
E.D. Brooke
VICE PRESIDENT

ERIE RAILROAD COMPANY
R. Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST LOUIS RAILROAD COMPANY
H. Klein
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
A.J. Bowman
VICE PRESIDENT

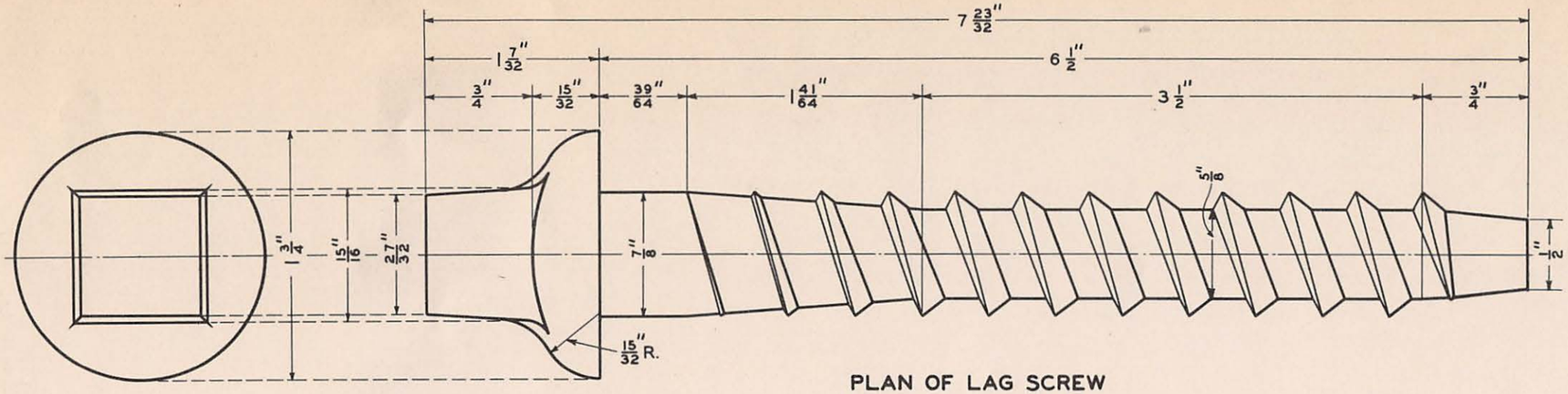
D.L.A.	D.L.A.	W.S.E.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK CHICAGO AND ST LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

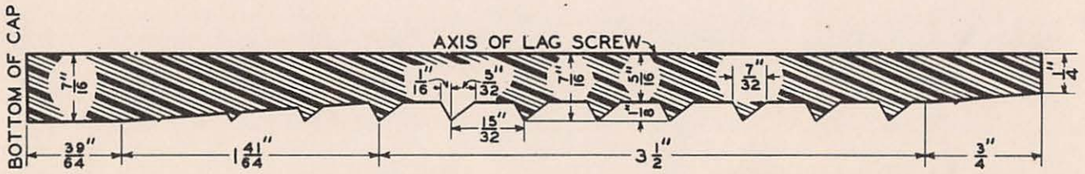
STANDARD 130 LB. RE. INSULATED RAIL JOINT

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: DEC. 16, 1930
CHIEF ENGINEER

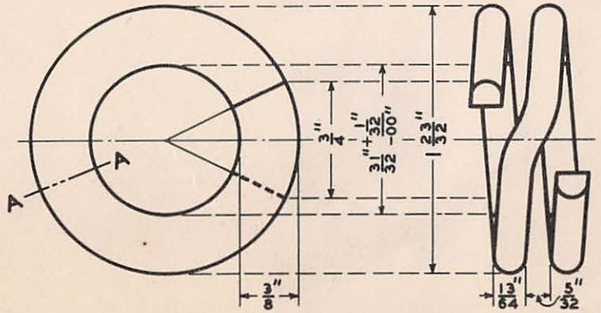
R-522



PLAN OF LAG SCREW



LONGITUDINAL SECTION OF LAG SCREW



SPRING WASHER

SECTION A-A

NOTE:
THESE DIMENSIONS ARE AFTER SPRING WASHER HAS BEEN HEAT TREATED AND SET.

SCALE IN INCHES
0 1 2

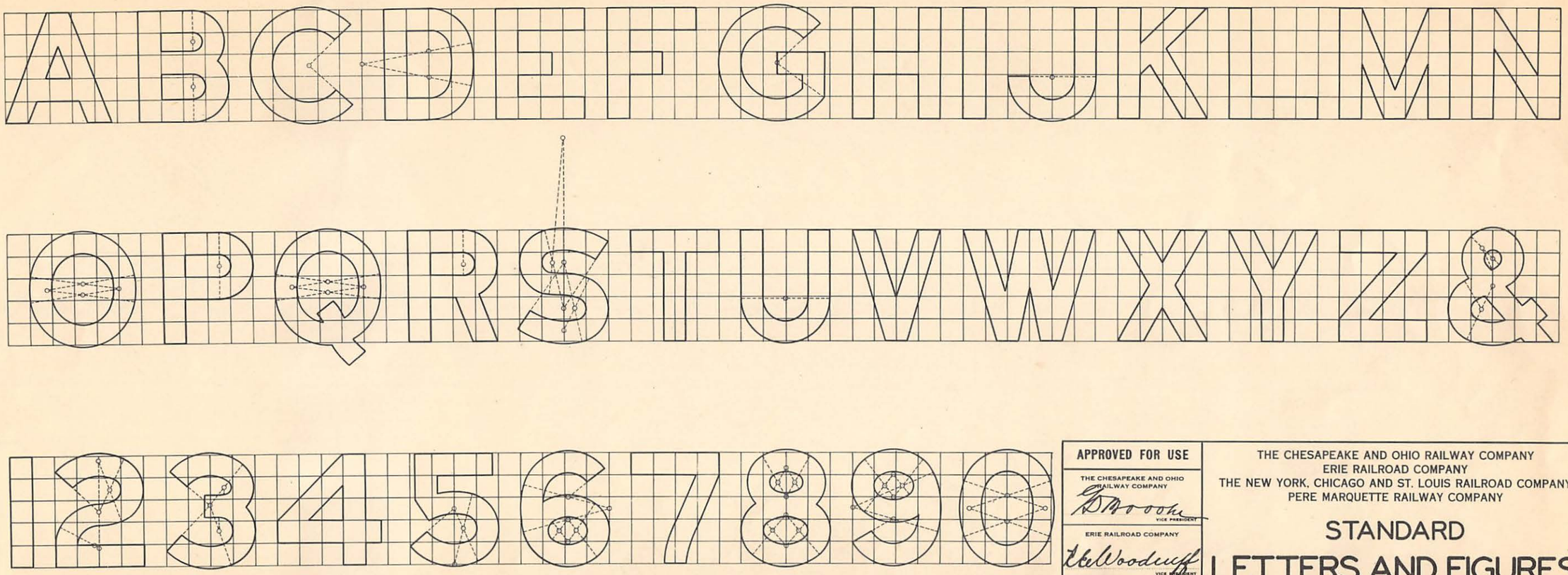
APPROVED FOR USE			
THE CHESAPEAKE AND OHIO RAILWAY COMPANY — D Brooke, VICE PRESIDENT			
ERIE RAILROAD COMPANY — R E Woodruff, VICE PRESIDENT			
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY — D Brooke, VICE PRESIDENT			
PERE MARQUETTE RAILWAY COMPANY — [illegible], VICE PRESIDENT			
T. F. M.	W. S. E.	J. R. S.	
T. F. M.			

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD
LAG SCREW AND SPRING WASHER FOR TIE PLATE

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: [signature] CHIEF ENGINEER AUG. 21, 1934

R-523-A



APPROVED FOR USE

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VICE PRESIDENT

ERIE RAILROAD COMPANY
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PERE MARQUETTE RAILWAY COMPANY
VICE PRESIDENT

J.R.S.	W.S.E.	J.R.S.
J.R.S.		

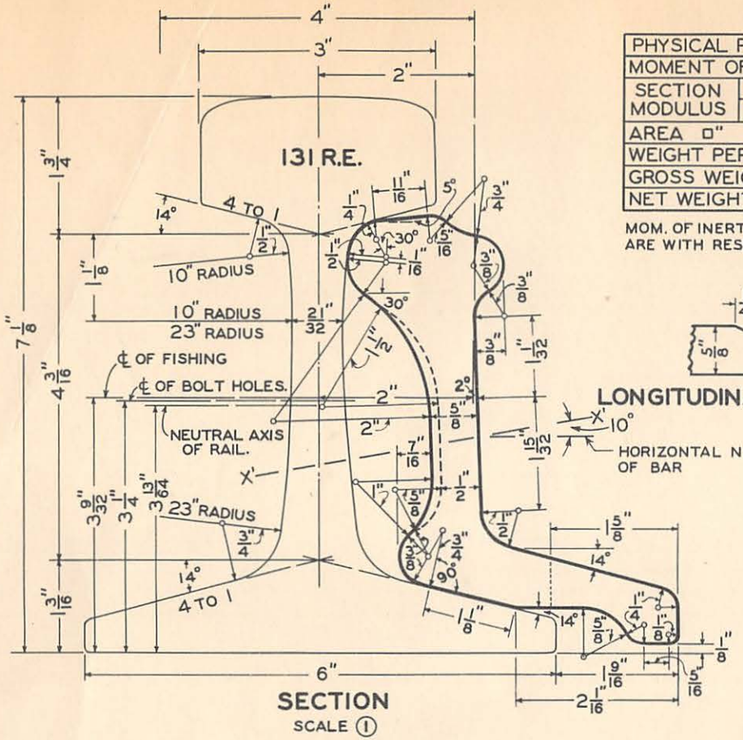
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD LETTERS AND FIGURES FOR SIGNS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: _____ APRIL 21, 1931
CHIEF ENGINEER

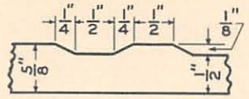
R-549



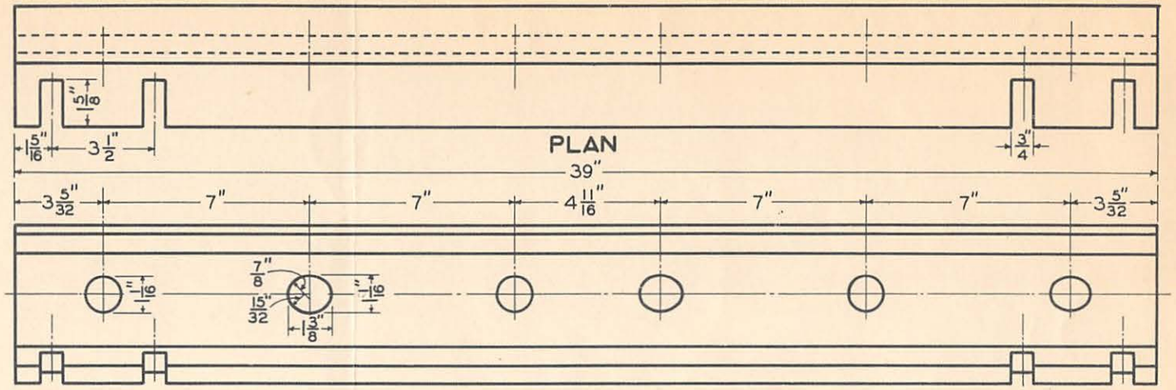
SECTION
SCALE ①

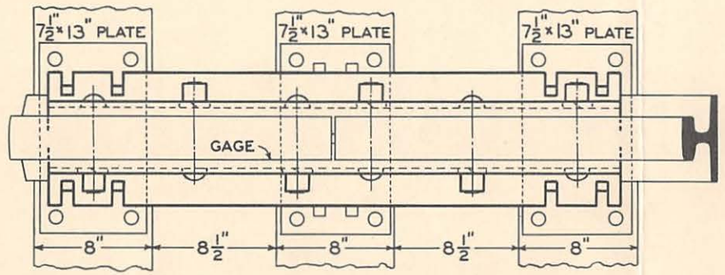
PHYSICAL PROPERTIES (2 BARS)		
MOMENT OF INERTIA		44.6
SECTION MODULUS	ABOVE N.A.	15.4
	BELOW N.A.	14.4
AREA □"		12.55
WEIGHT PER INCH LBS.		3.56
GROSS WEIGHT	"	138.68
NET WEIGHT	"	134.81

MOM. OF INERTIA AND SECT. MODULUS ARE WITH RESPECT TO AXIS X'-X'



LONGITUDINAL SECTION OF WEB
SCALE ①



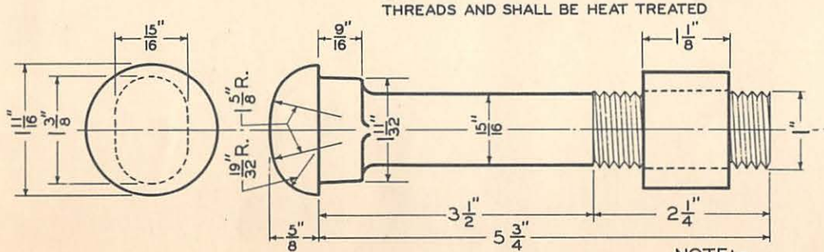


PLAN OF JOINT
SCALE ③

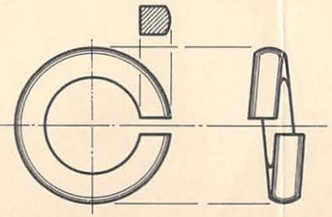
RAIL DRILLING
SCALE ③

SCALE IN INCHES
① 0 1 2 3
② 0 1 2 4 6 8
③ 0 2 4 8 12 16

BOLTS SHALL HAVE U.S. STANDARD ROLLED THREADS AND SHALL BE HEAT TREATED



TRACK BOLT
SCALE ①



SPRING WASHER
(OF APPROVED DESIGN)

NOTE:-
MATERIAL FOR RAIL JOINTS SHALL CONFORM TO LATEST REVISION OF STANDARD SPECIFICATIONS R-4, QUENCHED CARBON STEEL JOINT BARS AND FOR BOLTS TO LATEST REVISION OF STANDARD SPECIFICATIONS R-14, QUENCHED CARBON STEEL AND ALLOY STEEL TRACK BOLTS.

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ERIE RAILROAD COMPANY — R Kellwoodruff, VICE PRESIDENT
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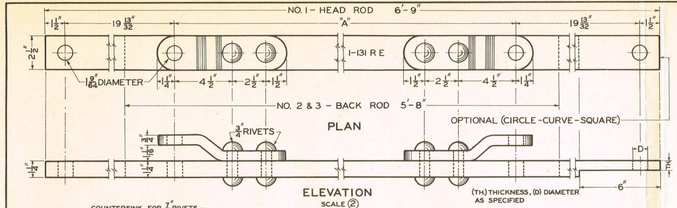
J. B. T. | H. L. S. | W. S. E. | J. R. S.

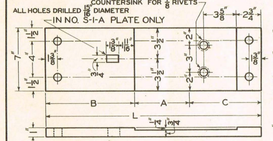
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

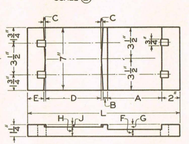
STANDARD
131-LB. R.E. RAIL JOINT

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: W Wallace, CHIEF ENGINEER — FEB. 20, 1934

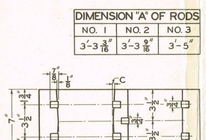
R-675



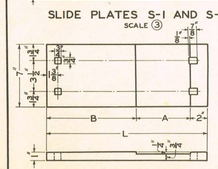


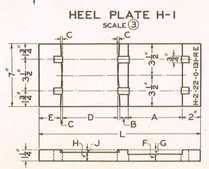


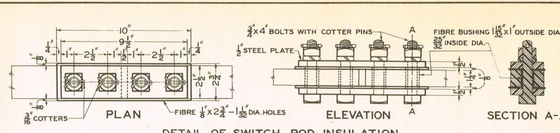
DIMENSION "A" OF RODS		
NO. 1	NO. 2	NO. 3
3-3 3/16	3-3 9/16	3-5"



NOTE:-
SPIKE HOLES ADJACENT TO SHOULDERS TO BE PUNCHED 3/4" x 1 1/4" OUTSIDE OF SHOULDER. ALL OTHER SPIKE HOLES TO BE PUNCHED AS NOTED. CORNERS TO BE ROUNDED TO 1/4" RADIUS. MARKING - STAMP DESIGNATION ON PLATES AS SHOWN WITH 1/2" FIGURES AND LETTERS.



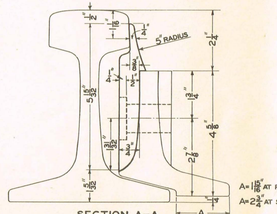


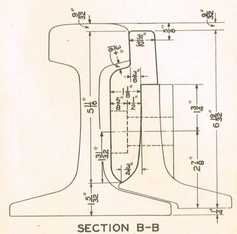


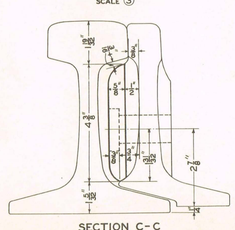
NOTE:-
FIBRE SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-1516, HARD FIBRE.

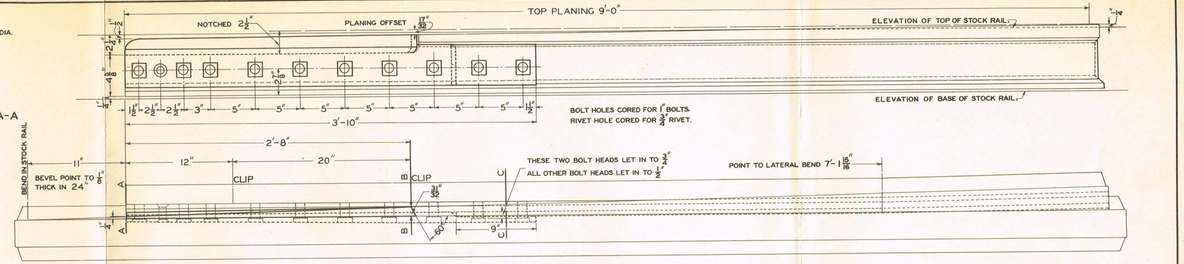
DIMENSIONS OF PLATES											
PLATE	NO. REQD	INCHES									
		L	A	B	C	D	E	F	G	H	J
S-1-A	4	24	6 1/16	9 13/16	8 1/8	–	–	–	–	–	–
S-1	8(DR'D)	24	6 1/16	9 13/16	8 1/8	–	–	–	–	–	–
S-2	16	18	6 1/16	9 13/16	–	–	–	–	–	–	–
H-1	2	17 1/2	6 1/16	1/2	1/16	6 5/16	2 1/2	3/4	1/2	1	1/4
H-2	2	17 1/2	6 1/16	1 9/16	1/16	6 1/4	2 1/2	3/4	1/2	1 15/16	5/16
H-3	2	18	6 1/16	1 13/16	1/16	6 3/8	2 7/16	3/4	1/2	2 1/16	3/8
H-4	2	18 1/2	6 1/16	2 1/16	3/32	6 1/8	2 1/4	3/4	1/2	2 13/16	7/16
H-5	2	19	6 1/16	2 5/16	3/32	6 1/16	2 5/32	3/4	1/2	3/4	1/2
H-6	2	19 1/2	6 1/16	2 7/16	3/32	6 1/16	2 5/32	3/4	1/2	3/4	1/2
H-7	2	20	6 1/16	3 1/16	3/32	6 1/16	2 5/32	3/4	1/2	3/4	1/2
H-8	2	20 1/2	6 1/16	3 3/16	3/32	6 1/16	2 5/32	3/4	1/2	3/4	1/2
H-9	2	21	6 1/16	4 1/16	1/8	6 1/16	2 5/32	3/4	1/2	3/4	1/2
H-10	2	22	6 1/16	5 1/32	1/8	6 1/16	2 13/32	3/4	1/2	3/4	1/2
H-11	2	22 1/2	6 1/16	5 1/8	1/8	6 1/16	2 1/4	3/4	1/2	3/4	1/2
H-12	2	23	6 1/16	5 9/32	1/8	6 1/16	2	3/4	1/2	3/4	1/2

NOTE:-
FOR DETAILS OF RAIL BRACE SEE LATEST REVISION OF STANDARD DRAWING R-700, ADJUSTABLE TWO PIECE RAIL BRACE.









SCALE IN INCHES
① 0 1 2 3 4
② 0 2 4 6 8
③ 0 3 6 9 12

APPROVED FOR USE
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

THE CHESAPEAKE AND OHIO RAILWAY COMPANY — VICE PRESIDENT
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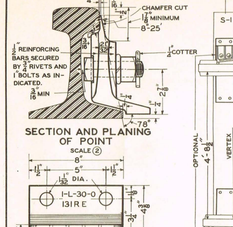
J.R.S. D.L.A. W.S.E. J.R.S.

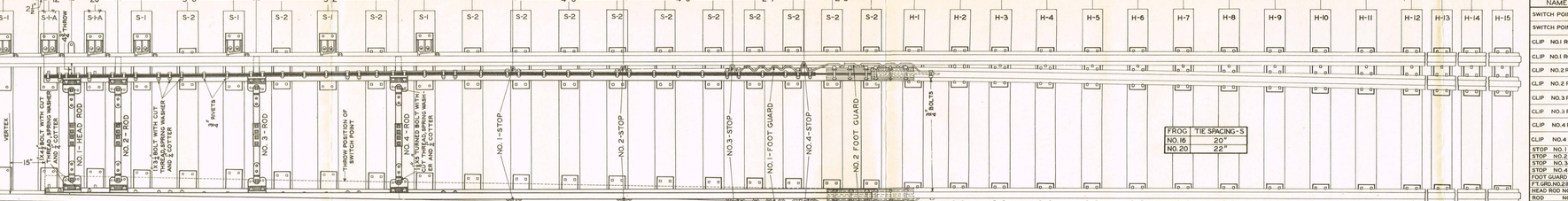
STANDARD 131 - LB. R.E.
22'-0" SPLIT SWITCH FIXTURES

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED JUNE 18, 1935
CHIEF ENGINEER

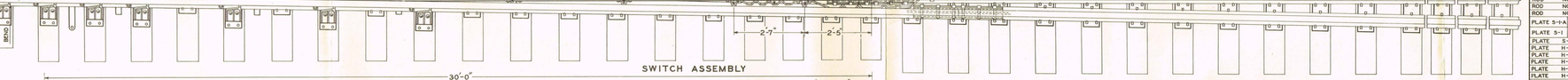
SHEET 2 OF 2
R-680-A



CLIP DRILLING												
	#1 CLIP		#2 CLIP		#3 CLIP		#4 CLIP		#5 CLIPS			
	T	S	T	G	T	G	USE "G"	USE "C"	T	S		
HOLE A	3/4	3/4	3/4	3/4	3/4	3/4	HOLE FOR MANG.PT.	HOLE FOR MANG.PT.	3/4	3/4		
HOLE B	3/4	3/4	3/4	3/4	3/4	3/4	HOLE FOR 2 MG.PTS.	HOLE FOR 2 MG.PTS.	3/4	3/4		



FROG	TIE SPACING-S
NO.16	20"
NO.20	22"



NOTE:HOLES MARKED B TO BE DRILLED FOR I BOLTS, 2 1/2 FROM BASE OF SWITCH POINT TO 5/8 OF HOLES.ALL OTHER HOLES TO BE DRILLED FOR 3/4 BOLTS AND RIVETS, 3 1/2 FROM BASE OF SWITCH POINT.

NOTE:- WHEN ONE SWITCH POINT IS ORDERED (RIGHT OR LEFT HAND), THE TRANSIT CLIPS, STOPS, AND NO. 1 FOOT GUARD FOR IT SHALL BE FURNISHED.

BILL OF MATERIAL

NAME	MARK	NO. PCS.
SWITCH POINT	R-30-0 131 R E	1
SWITCH POINT	L-30-0 131 R E	1
CLIP NO.1 ROD	1-R-30-0 131 R E	1
CLIP NO.1 ROD	1-L-30-0 131 R E	1
CLIP NO.2 ROD	2-R-30-0 131 R E	1
CLIP NO.2 ROD	2-L-30-0 131 R E	1
CLIP NO.3 ROD	3-R-30-0 131 R E	1
CLIP NO.3 ROD	3-L-30-0 131 R E	1
CLIP NO.4 ROD	4-R-30-0 131 R E	1
CLIP NO.4 ROD	4-L-30-0 131 R E	1
STOP NO.1		2
STOP NO.2		2
STOP NO.3		2
STOP NO.4		2
FOOT GUARD NO.1		2
FT.GRD.NO.2 INCLUDING 3/4" BOLT		2
HEAD ROD NO.1	1-131 R E	1
ROD NO.2	2-131 R E	1
ROD NO.3	3-131 R E	1
ROD NO.4	4-131 R E	1
PLATE S-1-A	30" ADJUST-ABLE BRACE ASSEMBLED	S-1-A 4
PLATE S-1		S-1 8(OR 10)
PLATE S-2		S-2 131 R E 26
PLATE H-1		H-1-30-0-131 R E 2
PLATE H-2		H-2-30-0-131 R E 2
PLATE H-3		H-3-30-0-131 R E 2
PLATE H-4		H-4-30-0-131 R E 2
PLATE H-5		H-5-30-0-131 R E 2
PLATE H-6		H-6-30-0-131 R E 2
PLATE H-7		H-7-30-0-131 R E 2
PLATE H-8		H-8-30-0-131 R E 2
PLATE H-9		H-9-30-0-131 R E 2
PLATE H-10		H-10-30-0-131 R E 2
PLATE H-11		H-11-30-0-131 R E 2
PLATE H-12		H-12-30-0-131 R E 2
PLATE H-13		H-13-30-0-131 R E 2
PLATE H-14		H-14-30-0-131 R E 2
PLATE H-15		H-15-30-0-131 R E 2

FIGURE IN BRACKETS IS OPTIONAL AND IS TO BE USED ONLY WHEN SPECIFIED.

NOTE:—CHAMFER CUT—MAKE SWITCH POINT 1/4 THICK AND RUN OUT IN 24" FROM END OF POINT. ROUND POINT TO 1/8 RADIUS AND GRIND TO SHARP EDGE.

NAME OR INITIALS OF MANUFACTURER,SECTION AND WEIGHT OF RAIL,NAME AND YEAR MADE SHALL BE PLAINLY STAMPED IN 3/4 FIGURES AND LETTERS ON A RAIL PORTION OF THE STRUCTURE NOT EXPOSED TO WHEEL WEAR AND WHERE PLAINLY VISIBLE, SMALLER FIGURES AND LETTERS MAY BE USED IF ABOVE IS ON A RUST PROOF PLATE RIVETED TO WEB OF RAIL.

BOLTS SHALL HAVE A CLEARANCE OF NOT MORE THAN 1/16 IN DRILLED HOLES AND SHALL BE FITTED WITH SPRING WASHERS OF APPROVED DESIGN,AND COTTERS.HEADS SHALL BE REGULAR,SQUARE,AS PER TABLE I,AND NUTS,HEAVY,SQUARE,AS PER TABLE 13(A.S.A. B18.2,1933).THREADS FOR BOLTS SHALL BE AS PER TABLE II AND THREADS FOR NUTS AS PER TABLE 12. (A.S.A. B1.1-1935).

MATERIAL SHALL CONFORM TO LATEST REVISION OF STANDARD SPECIFICATIONS R-13, SWITCHES, FROGS, CROSSINGS, AND GUARD RAILS.

FOR DETAILS OF RAIL BRACE, SEE LATEST REVISION OF STANDARD DRAWING R-700 , ADJUSTABLE TWO PIECE RAIL BRACE.

PLATES S-1 AND S-1-A TO BE LAGGED TO SWITCH TIMBER WITH FOUR 5/8 LAG SCREWS AND FOUR DOUBLE COIL SPRING WASHERS, SEE STANDARD DRAWING R-523.

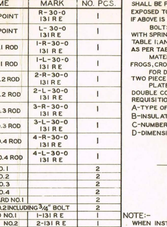
REQUISITION SHALL SPECIFY FOLLOWING INFORMATION:

A-TYPE OF POINT IF OTHER THAN STANDARD OPENHEARTH.

B-INSULATED OR NONINSULATED RODS.

C-NUMBER OF S-1 PLATES IF OTHER THAN MINIMUM 15 REQUIRED.

D-DIMENSIONS "H" AND "D" ON NO.1 ROD.



NOTE:-

WHEN INSTALLING SWITCH FOR INTERLOCKED SERVICE, SWITCH TIES NECESSARY FOR SUPPORTING INTERLOCKING APPARATUS SHALL BE USED AND TIE ARRANGEMENT AT SWITCH POINTS SHALL BE IN ACCORDANCE WITH THE TYPE OF INTERLOCKING TO BE USED.

SCALE IN INCHES

① 0 12 24 36

② 0 1 2 3 4 5 6

③ 0 2 4 6 8

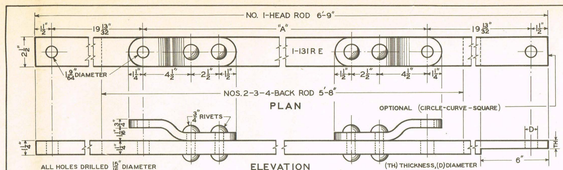
APPROVED FOR USE
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY
D.L.A.
D.L.A.
W.S.E.
J.R.S.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD 131-LB. R.E. 30'-0 SPLIT SWITCH WITH UNIFORM RISERS

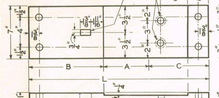
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 18, 1935

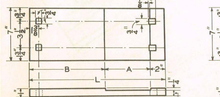
SHEET TOP 2
R-681-A

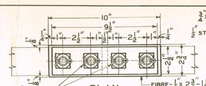


DIMENSION "A" OF RODS			
NO.1	NO.2	NO.3	NO.4
3'-3 3/8"	3'-3 7/8"	3'-5"	3'-5 7/8"

NOTE:—
SPIKE HOLES ADJACENT TO SHOULDERS TO BE PUNCHED 3/4" x 5/8" OUTSIDE OF SHOULDER. ALL OTHER SPIKE HOLES TO BE PUNCHED AS NOTED. CORNERS TO BE ROUNDED TO 5/8" RADIUS. MARKING-STAMP DESIGNATION ON PLATES AS SHOWN WITH 1/2" FIGURES AND LETTERS.

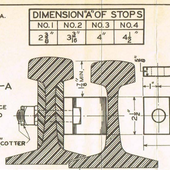




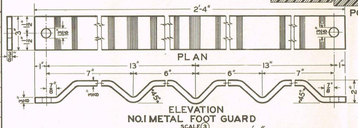

3/4" x 4 BOLTS WITH COTTER PINS
STEEL PLATE
FIBRE BUSHING 1 3/16" OUTSIDE DIA. 13/16" INSIDE DIA.
COTTERS
FIBRE 1/4" x 2 1/2" - 1 1/16" DIA. HOLES
PLAN
ELEVATION
SECTION A-A
DETAIL OF SWITCH ROD INSULATION
SCALE ③

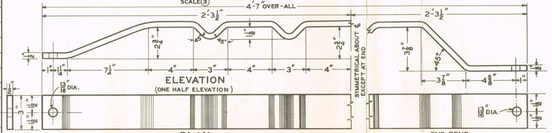
DIMENSION "A" OF STOPS			
NO.1	NO.2	NO.3	NO.4
2 3/8"	3 3/8"	4"	4 1/2"

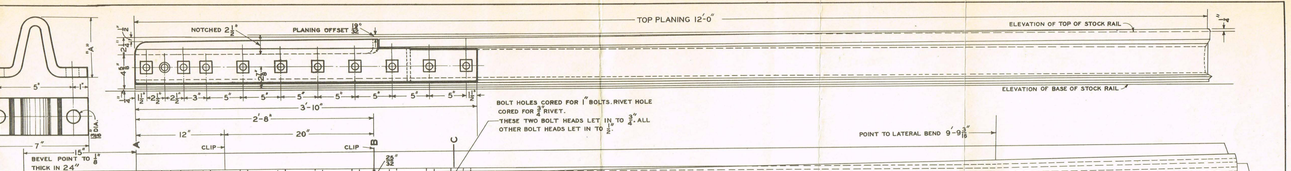
NOTE:—
FIBRE SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFICATIONS S-508, HARD FIBRE.



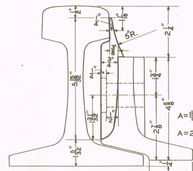
DIMENSIONS OF PLATES											
PLATE	NO. REQ.	INCHES									
		L	A	B	C	D	E	F	G	H	J
S-1-A	4	24	6 1/4	9 1/2	6 1/2	–	–	–	–	–	–
S-1	PER 100	24	6 1/4	9 1/2	6 1/2	–	–	–	–	–	–
S-2	26	18	6 1/4	9 1/2	6 1/2	–	–	–	–	–	–
H-1	2	17	6 1/4	–	1/4	6 1/2	2 5/8	3/4	3/4	1	1/4
H-2	2	17	6 1/4	13/32	1/4	6 1/2	15/16	3/4	3/4	31/32	5/16
H-3	2	17 1/2	6 1/4	1 1/2	1/4	6 1/2	2 1/8	3/4	3/4	1 1/8	1/8
H-4	2	18	6 1/4	1 15/16	1/4	6 1/2	2 5/16	3/4	3/4	1 29/32	5/16
H-5	2	18 1/2	6 1/4	1 15/16	1/4	6 1/2	2 5/16	3/4	3/4	1 29/32	5/16
H-6	2	19	6 1/4	2 11/16	1/4	6 1/2	2 13/16	3/4	3/4	1 13/16	7/16
H-7	2	19	6 1/4	2 29/32	1/4	6 1/2	2 15/16	3/4	3/4	1 13/16	7/16
H-8	2	19 1/2	6 1/4	3 5/16	1/4	6 1/2	3 1/16	3/4	3/4	1 13/16	7/16
H-9	2	20	6 1/4	3 11/16	1/4	6 1/2	3	3/4	3/4	1 13/16	7/16
H-10	2	20 1/2	6 1/4	4 1/8	1/4	6 1/2	3	3/4	3/4	1 13/16	7/16
H-11	2	21	6 1/4	4 1/16	1/4	6 1/2	3	3/4	3/4	1 13/16	7/16
H-12	2	21 1/2	6 1/4	4 1/2	1/4	6 1/2	3 1/16	3/4	3/4	1 13/16	7/16
H-13	2	22	6 1/4	5	1/4	6 1/2	3 1/16	3/4	3/4	1 13/16	7/16
H-14	2	23	6 1/4	5 1/2	1/4	6 1/2	3 1/16	3/4	3/4	1 13/16	7/16
H-15	2	23 1/2	6 1/4	6	1/4	6 1/2	2 7/8	3/4	3/4	1 13/16	7/16

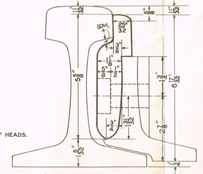


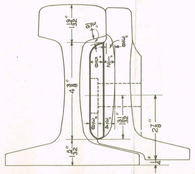



NOTCHED 2"
PLANING OFFSET 3/32"
TOP PLANING 12'-0"
ELEVATION OF TOP OF STOCK RAIL
ELEVATION OF BASE OF STOCK RAIL
3'-10"
2'-8"
12" CLIP
20" CLIP
BOLT HOLES CORED FOR 1" BOLTS. RIVET HOLE CORED FOR 3/4" RIVET.
THESE TWO BOLT HEADS LET IN TO 1/2", ALL OTHER BOLT HEADS LET IN TO 3/8".
POINT TO LATERAL BEND 9'-9 1/2"
2'-8" MANGANESE STEEL WEARING POINT
SCALE ④

NOTE:—
FOR DETAILS OF RAIL BRACE SEE LATEST REVISION OF STANDARD DRAWING R-700, ADJUSTABLE TWO PIECE RAIL BRACE.







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THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
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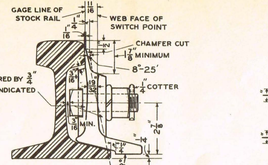
PERE MARQUETTE RAILWAY COMPANY

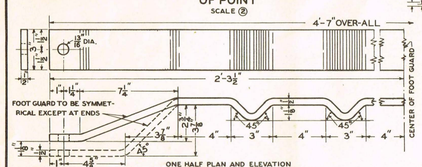
STANDARD 131-LB.R.E. 30'-0" SPLIT SWITCH FIXTURES

APPROVED BY ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED:— JUNE 18, 1935
CHIEF ENGINEER

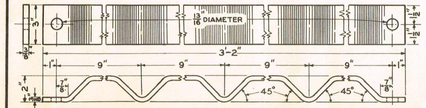
SHEET 2 OF 2
R-681-A


GAGE LINE OF STOCK RAIL
WEB FACE OF SWITCH POINT
CHAMFER CUT
1/8" MINIMUM
8"-25#
1/4" REINFORCING BARS SECURED BY 3/4" RIVETS AND 1" BOLTS AS INDICATED
1/4" COTTER

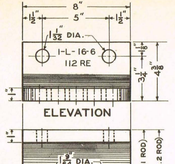
SECTION AND PLANING OF POINT
SCALE ②



ONE HALF PLAN AND ELEVATION
NO.2 METAL FOOT GUARD
SCALE ③



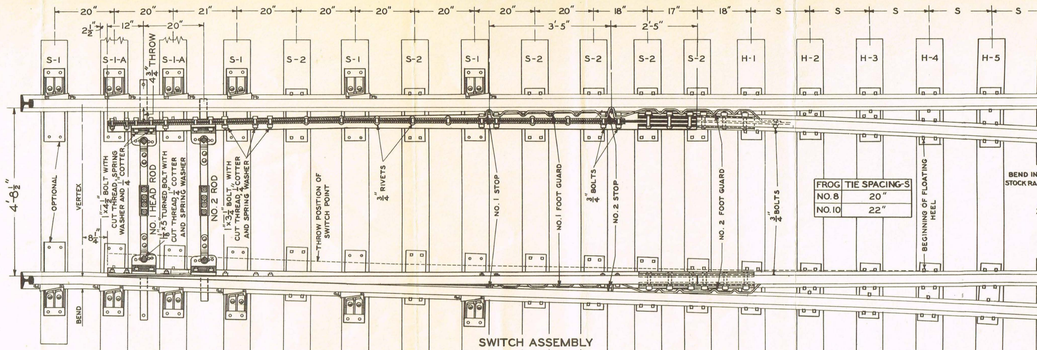
NO.1 METAL FOOT GUARD
SCALE ③



PLAN
TRANSIT CLIP
SCALE ③

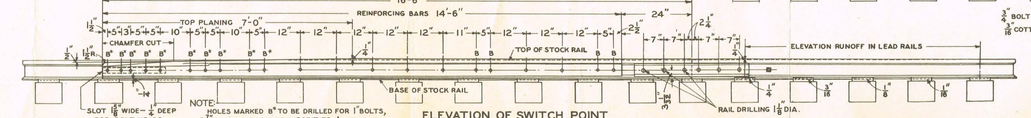
A - 2-MANG. POINTS
B - 1-MANG. AND 1-O.H. POINT
C - 2-O.H. POINTS
D) ADJUSTMENT FOR
E) 2-O.H. POINTS

CLIP DRILLING	NO.1 CLIP		NO.2 CLIP	
	F	G	F	G
HOLE A	—	3/8	—	5/8
HOLE B	3/16	—	1/16	—



FROG	TIE SPACING-S
NO.8	20"
NO.10	22"

SWITCH ASSEMBLY


16'-6"
REINFORCING BARS 14'-6"
TOP PLANING 7'-0"
CHAMFER CUT
TOP OF STOCK RAIL
BASE OF STOCK RAIL
ELEVATION RUNOFF IN LEAD RAILS
SLOT 15/16" WIDE - 1/2" DEEP FOR BOLT HEADS
RAIL DRILLING 1 1/16" DIA.

NOTE:
HOLES MARKED "B" TO BE DRILLED FOR 1" BOLTS, 2 1/2" FROM BASE OF SWITCH POINT TO ℄ OF HOLES. ALL OTHER HOLES TO BE DRILLED FOR 3/4" BOLTS AND RIVETS, 3 1/32" FROM BASE OF SWITCH POINT.

ELEVATION OF SWITCH POINT
SCALE ①

NOTE:-
WHEN INSTALLING SWITCH FOR INTERLOCKED SERVICE, SWITCH TIES NECESSARY FOR SUPPORTING INTERLOCKING APPARATUS SHALL BE USED AND THE ARRANGEMENT AT SWITCH POINTS SHALL BE IN ACCORDANCE WITH THE TYPE OF INTERLOCKING TO BE USED.

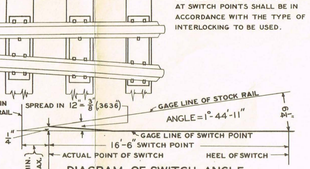
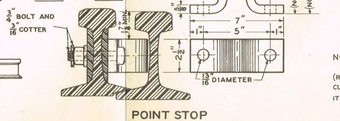

BEND IN STOCK RAIL
SPREAD IN 12" = 2 3/8" (3636)
GAGE LINE OF STOCK RAIL
ANGLE = 12° 44'-11"
GAGE LINE OF SWITCH POINT
16'-6" SWITCH POINT
ACTUAL POINT OF SWITCH
HEEL OF SWITCH
8 1/2" MIN. TO GUARD

DIAGRAM OF SWITCH ANGLE
NO SCALE



POINT STOP
SCALE ③

NOTE:-
WHEN ONE SWITCH POINT IS ORDERED (RIGHT OR LEFT HAND), THE TRANSIT CLIPS, STOPS, AND NO.1 FOOT GUARD FOR IT SHALL BE FURNISHED.

BILL OF MATERIAL

NAME	MARK	NO. PIECES
SWITCH POINT	R-16-6 112 RE	1
SWITCH POINT	L-16-6 112 RE	1
CLIP NO.1 ROD	I-L-16-6 112 RE	1
CLIP NO.1 ROD	I-R-16-6 112 RE	1
CLIP NO.2 ROD	2-L-16-6 112 RE	1
CLIP NO.2 ROD	2-R-16-6 112 RE	1
STOP NO. 1		2
" NO.2		2
FOOT GUARD NO.1		2
FOOT GD. NO.2 INCLUDING 3/4" BOLT		2
HEAD ROD	1-112 RE	1
BACK ROD	2-112 RE	1
PLATE S-1-A	WITH ADJUSTABLE BRACE	S-1-A 4
PLATE S-1	ASSEMBLED	S-1 6 (OR 8)
PLATE S-2	S-2-112 RE	12
PLATE H-1	H-1-16-8-112 RE	2
PLATE H-2	H-2-16-6-112 RE	2
PLATE H-3	H-3-16-6-112 RE	2
PLATE H-4	H-4-16-6-112 RE	2
PLATE H-5	H-5-16-6-112 RE	2
PLATE H-6	H-6-16-6-112 RE	2
PLATE H-7	H-7-16-6-112 RE	2
PLATE H-8	H-8-16-6-112 RE	2

FIGURE IN BRACKETS IS OPTIONAL AND IS TO BE USED ONLY WHEN SPECIFIED.

NOTE:-
CHAMFER CUT - MAKE SWITCH POINT 1/8" THICK AND RUN OUT IN 24" FROM END OF POINT. ROUND POINT TO 1/2" RADIUS AND GRIND TO SHARP EDGE.
NAME OR INITIALS OF MANUFACTURER, SECTION AND WEIGHT OF RAIL, NAME AND YEAR MADE SHALL BE PLAINLY STAMPED IN 1/2" FIGURES AND LETTERS ON A RAIL PORTION OF THE STRUCTURE NOT EXPOSED TO WHEEL WEAR AND WHERE PLAINLY VISIBLE. SMALLER FIGURES AND LETTERS MAY BE USED IF ABOVE IS ON A RUST PROOF PLATE RIVETED TO WEB OF RAIL.
BOLTS SHALL HAVE A CLEARANCE OF NOT MORE THAN 1/32" IN DRILLED HOLES AND SHALL BE FITTED WITH SPRING WASHERS OF APPROVED DESIGN, AND COTTERS. HEADS SHALL BE REGULAR, SQUARE, AS PER TABLE I; AND NUTS, HEAVY, SQUARE, AS PER TABLE 13 (A.S.A. B 18.2 - 1933). THREADS FOR BOLTS SHALL BE AS PER TABLE II AND THREADS FOR NUTS AS PER TABLE 12 (A.S.A. B1.1 - 1935).
MATERIAL SHALL CONFORM TO LATEST REVISION OF STANDARD SPECIFICATIONS R-13, SWITCHES, FROGS, CROSSINGS, AND GUARD RAILS. FOR DETAILS OF RAIL, SEE LATEST REVISION OF STANDARD DRAWING R-700, ADJUSTABLE TWO PIECE RAIL BRACE.
PLATES S-1 AND S-1-A TO BE LAGGED TO SWITCH TIMBER WITH FOUR LAG SCREWS AND FOUR DOUBLE COIL SPRING WASHERS; DRAWING R-523.
REQUISITION SHALL SPECIFY FOLLOWING INFORMATION:
A - TYPE OF POINT IF OTHER THAN STANDARD OPEN HEARTH.
B - INSULATED OR NONINSULATED RODS.
C - NUMBER OF S-1 PLATES IF OTHER THAN MINIMUM IS REQUIRED.
D - DIMENSIONS "H" AND "D" ON NO.1 ROD.

SCALE IN INCHES
① 0 12 24 36
② 0 2 4
③ 0 2 4 6 8

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THE CHESAPEAKE AND OHIO RAILWAY COMPANY
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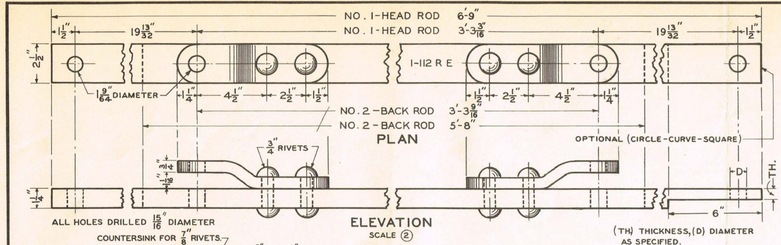
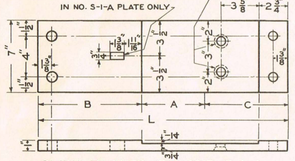
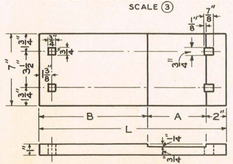
STANDARD 112-LB. R.E. 16'-6" SPLIT SWITCH WITH UNIFORM RISERS

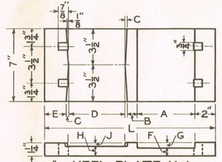
APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED: JUNE 18, 1955
CHIEF ENGINEER

SHEET 1 OF 2
R-682-A









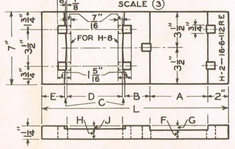
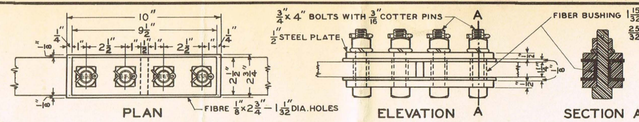


PLATE	NO. REQ.	DIMENSIONS OF PLATES IN INCHES									
		L	A	B	C	D	E	F	G	H	J
S-1-A	4	24	5 5/16	9 13/16	8 5/8	—	—	—	—	—	—
S-1	6 ORIG	24	5 5/16	9 13/16	8 5/8	—	—	—	—	—	—
S-2	12	18	5 5/16	10 7/16	—	—	—	—	—	—	—
H-1	2	17 1/2	5 5/16	1 1/16	1 1/8	5 15/16	2 5/16	3/4	1 1/2	1	1 1/4
H-2	2	17 1/2	5 5/16	1 13/16	1 1/8	5 13/16	2 1/16	3/4	1 1/2	15/16	5/16
H-3	2	18	5 5/16	2 9/16	1 1/8	5 11/16	1 15/16	3/4	1 1/2	7/8	3/8
H-4	2	19	5 5/16	3 3/8	5/32	5 5/8	1 13/16	3/4	1 1/2	13/16	7/16
H-5	2	20	5 5/16	4 5/32	5/32	5 5/8	2 11/16	3/4	1 1/2	3/4	1/2
H-6	2	21	5 5/16	5 5/32	5/32	5 5/8	2 9/16	3/4	1 1/2	3/4	1/2
H-7	2	21 1/2	5 5/16	6 1/16	5/32	5 5/8	2 15/16	3/4	1 1/2	3/4	1/2
H-8	2	23	5 5/16	6 31/32	5/32	6	2 5/32	3/4	1 1/2	3/4	1/2

NOTE:-

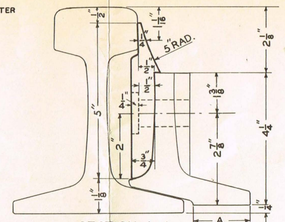
1/4" SPIKE HOLES ADJACENT TO SHOULDERS TO BE PUNCHED 3/4 x 7/8" 1/16" OUTSIDE OF SHOULDER. ALL OTHER SPIKE HOLES TO BE PUNCHED AS NOTED. CORNERS TO BE ROUNDED TO 1/16" RADIUS.

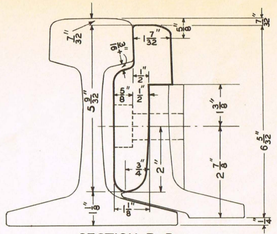
1/2" MARKING-STAMP DESIGNATION ON PLATES AS SHOWN WITH 1/2" FIGURES AND LETTERS.

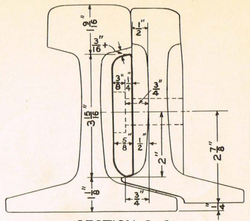


NOTE:-

FIBRE SHALL BE IN ACCORDANCE WITH LATEST REVISION OF STANDARD SPECIFCATIONS S-1516, HARD FIBRE.

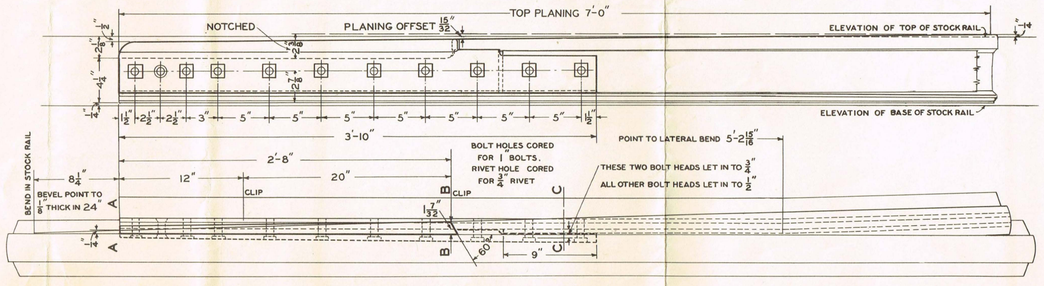






NOTE:-

FOR DETAILS OF RAIL BRACE SEE LATEST REVISION OF STANDARD DRAWING R-700, ADJUSTABLE TWO PIECE RAIL BRACE.



SCALE IN INCHES

① 0 1 2 3 4

② 0 2 4 6 8

③ 0 3 6 9 12

APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY	VICE PRESIDENT
ERIE RAILROAD COMPANY	VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY	VICE PRESIDENT
PERE MARQUETTE RAILWAY COMPANY	VICE PRESIDENT
H.L.S. H.L.S	W.S.E. J.R.S.

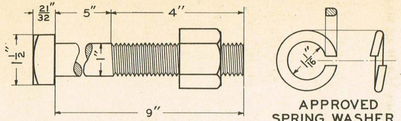
THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD 112-LB.R.E.
16'-6" SPLIT SWITCH
FIXTURES

APPROVED BY ADVISORY COMMITTEE ON WAY AND STRUCTURES
APPROVED JUNE 18, 1935
CHIEF ENGINEER

SHEET 2 OF 2

R-682-A

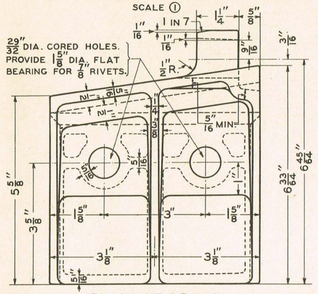


BOLT FOR ADJUSTABLE RAIL BRACE

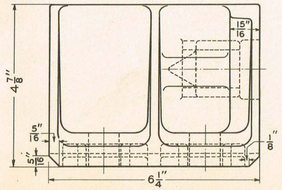
SCALE ①

APPROVED SPRING WASHER

SCALE ①

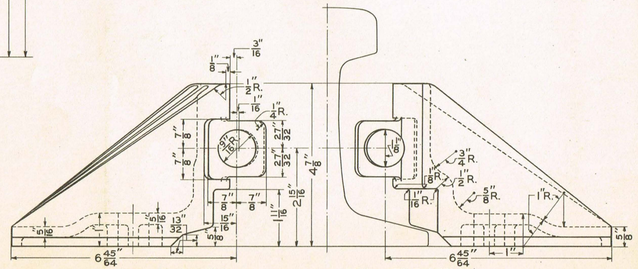


PLAN OF BRACE



SIDE ELEVATION

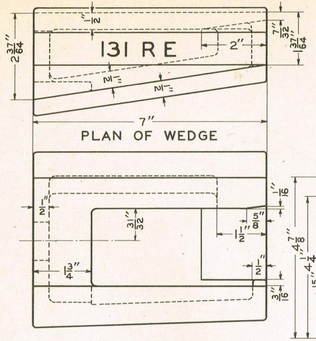
SCALE ①



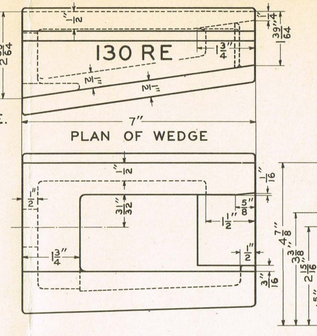
END ELEVATION

SCALE ①

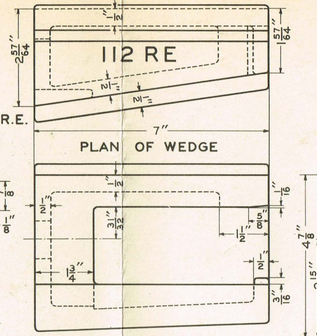
END ELEVATION



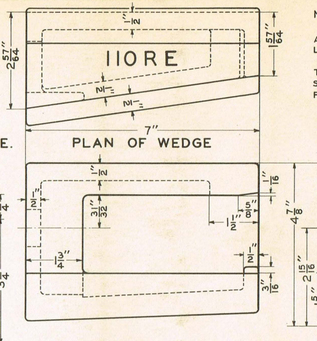
SCALE ①



SCALE ①



SCALE ①

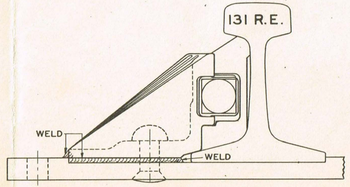


SCALE ①

NOTE:

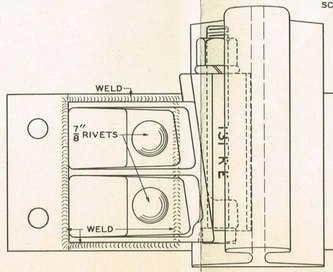
WEDGES SHALL BE STAMPED AS SHOWN WITH 1/2" FIGURES AND LETTERS.

MATERIAL SHALL CONFORM TO LATEST REVISION OF STANDARD SPECIFICATIONS R-13, SWITCHES, FROGS, CROSSINGS AND GUARD RAILS.



ELEVATION OF ASSEMBLY

SCALE ②



PLAN OF ASSEMBLY

SCALE ②

FOR DETAIL OF PLATE FOR BRACE SEE STANDARD SWITCH PLANS.

SLOT NO. S-1-A PLATES ONLY.

SCALE IN INCHES

① 0 1 2 3 4

② 0 1 2 3 4 5 6

APPROVED FOR USE	
THE CHESAPEAKE AND OHIO RAILWAY COMPANY	E. Brooks VICE PRESIDENT
ERIE RAILROAD COMPANY	H. Woodruff VICE PRESIDENT
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY	E. Brooks VICE PRESIDENT
PERE MARQUETTE RAILWAY COMPANY	[illegible] VICE PRESIDENT
C.H.W.	W.S.E. J.R.S.
C.H.W.	

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD ADJUSTABLE TWO PIECE RAIL BRACE

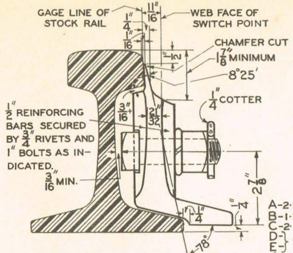
131, 130, 112 & 110 LB. R.E.

APPROVED BY ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED: MARCH 11, 1935.

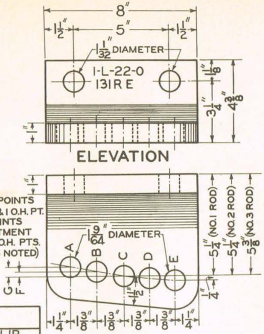
CHIEF ENGINEER

R-700


GAGE LINE OF STOCK RAIL
11/16"
WEB FACE OF SWITCH POINT
1/4"
1/16"
CHAMFER CUT
1/2"
1 7/8" MINIMUM
8°25'
1/4" COTTER
1/2" REINFORCING BARS SECURED BY 3/4" RIVETS AND 1" BOLTS AS INDICATED.
3/16"
21/32"
3/16" MIN.
2 7/8"
1/4"
1/4"
78°

SECTION AND PLANING OF POINT

SCALE ②

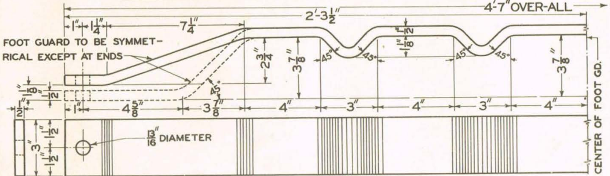

8"
1 1/2"
5"
1 1/2"
1 1/32" DIAMETER
1-L-22-0
131RE
1 1/8"
3 1/4"
4 3/8"
1"
ELEVATION
1"
A-2-MANG. POINTS
B-1-MANG. & 1 O.H. PT.
C-2-O.H. POINTS
D-} ADJUSTMENT
E-} FOR 2-O.H. PTS.
(EXCEPT AS NOTED)
1 9/64" DIAMETER
A
B
C
D
E
5 1/4" (NO.1 ROD)
5 1/4" (NO.2 ROD)
5 3/8" (NO.3 ROD)
G
F
1 1/2"
1/4"
1 1/4"
1 3/8"
1 3/8"
1 3/8"
1 3/8"
1 1/4"
PLAN

TRANSIT CLIP

SCALE ③

CLIP DRILLING

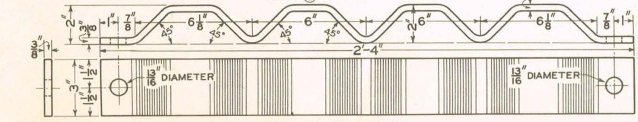
	NO.1 CLIP		NO.2 CLIP		NO.3 CLIP		
	F	G	F	G	USE "C" HOLE FOR 1 MANG. POINT. "D" HOLE FOR 2 MANG. PTS	F	G
HOLE A		5/16"		1/8"			1/4"
HOLE B	5/32"		1/16"			1/8"	


4'-7" OVER-ALL
2'-3 1/2"
1"
1 1/4"
7 1/4"
FOOT GUARD TO BE SYMMETRICAL EXCEPT AT ENDS
1/2"
2 3/4"
3 7/8"
45°
1 1/8"
45°
45°
45°
3 7/8"
1 1/8"
1/2"
45°
1/2"
1"
4 5/8"
3 7/8"
4"
3"
4"
3"
4"
CENTER OF FOOT GD.
13/16" DIAMETER
1 1/2"
3"
1 1/2"

NO. 2 METAL FOOT GUARD

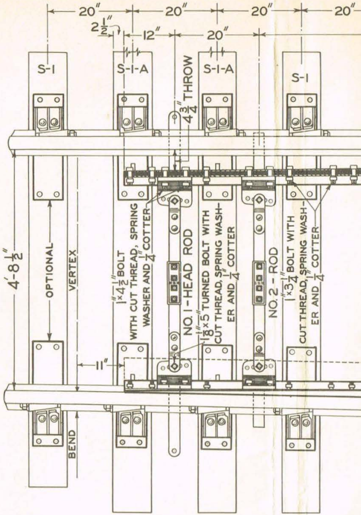
ONE HALF PLAN AND ELEVATION

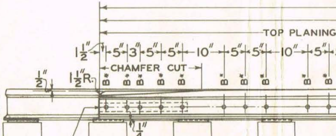
SCALE ③


2"
3/8"
1"
7/8"
6 1/8"
45°
45°
6"
45°
45°
2 6"
6 1/8"
3/8"
7/8"
1"
2'-4"
3/8"
13/16" DIAMETER
13/16" DIAMETER
1 1/2"
3"
1 1/2"

NO. 1 METAL FOOT GUARD

SCALE ③

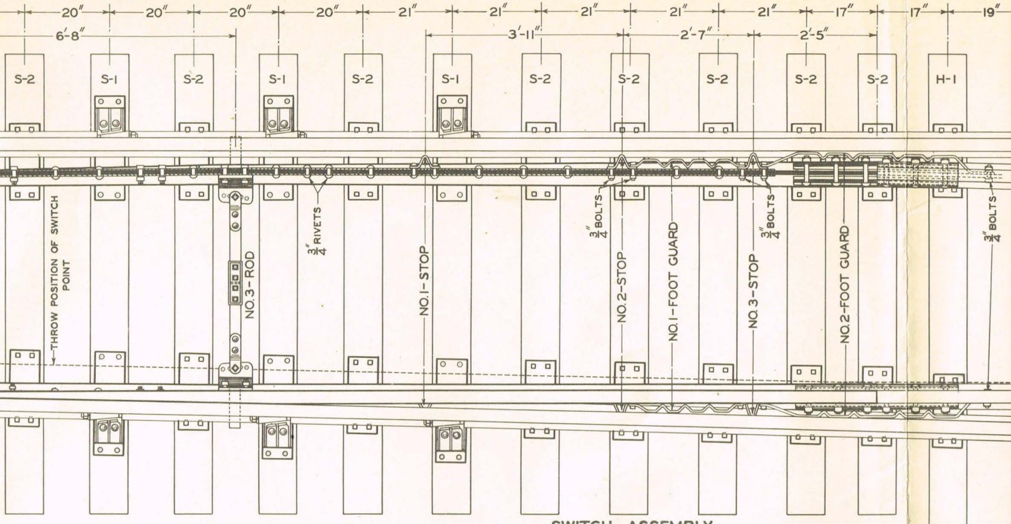

20"
20"
20"
20"
2 1/2"
12"
20"
S-1
S-1-A
4 3/4" THROW
S-1-A
S-1
4'-8 1/2"
OPTIONAL
VERTEX
BEND
11"
1"×4 1/2" BOLT WITH CUT THREAD, SPRING WASHER AND 1/4" COTTER
NO. 1-HEAD ROD
1 1/8"×5" TURNED BOLT WITH CUT THREAD, SPRING WASHER AND 1/4" COTTER
NO. 2 - ROD
1"×3 1/4" BOLT WITH CUT THREAD, SPRING WASHER AND 1/4" COTTER


TOP PLANING
1 1/2"
5"
3"
5"
5"
10"
5"
5"
10"
5"
CHAMFER CUT
1/2"
1 1/2" R.
1"
B*
B*
B*
B*
B*
B*
B*
B*
B*
B*
1/4"
SLOT 1 5/8" WIDE
1/4" DEEP FOR BOLT HEADS

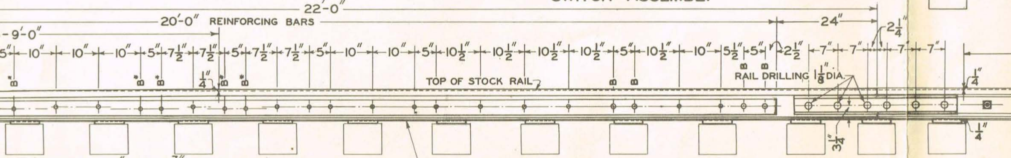
NOTE:-

HOLES MARKED B
POINT TO ℄ OF HO
RIVETS, 3 1/4" FROM

[redacted]


20"
20"
20"
20"
21"
21"
21"
21"
21"
17"
17"
19"
6'-8"
3'-11"
2'-7"
2'-5"
S-2
S-1
S-2
S-1
S-2
S-1
S-2
S-2
S-2
S-2
S-2
H-1
THROW POSITION OF SWITCH POINT
NO. 3-ROD
3/4" RIVETS
NO. 1-STOP
3/4" BOLTS
NO. 2-STOP
NO. 1-FOOT GUARD
NO. 3-STOP
3/4" BOLTS
NO. 2-FOOT GUARD
3/4" BOLTS

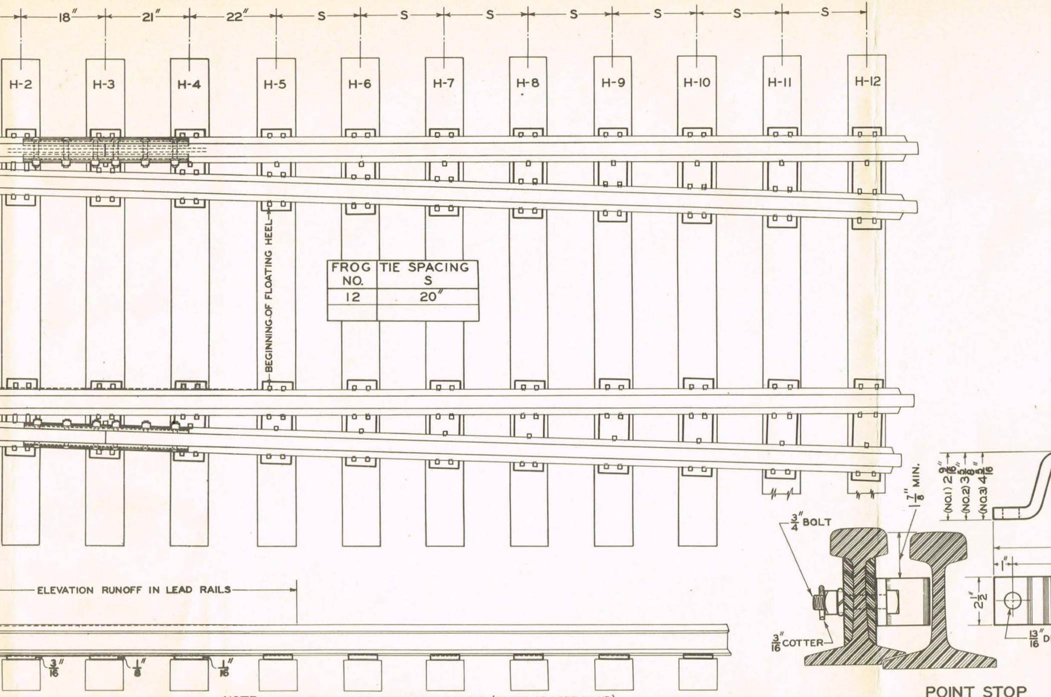
SWITCH ASSEMBLY


22'-0"
20'-0" REINFORCING BARS
9'-0"
24"
2 1/4"
5" 10" 10" 10" 5" 7 1/2" 7 1/2" 5" 7 1/2" 7 1/2" 5" 10" 10" 5" 10 1/2" 10 1/2" 10 1/2" 10 1/2" 5" 10 1/2" 10" 5 1/2" 5" 2 1/2" 7" 7" 7" 7"
*B
*B
*B
*B
*B
1/4"
TOP OF STOCK RAIL
B
B
B
B
RAIL DRILLING 1 1/8" DIA.
1/4"
3 1/4"
1/4"
BASE OF STOCK RAIL

*TO BE DRILLED FOR 1" BOLTS, $2\frac{7}{8}$" FROM BASE OF SWITCH
LES. ALL OTHER HOLES TO BE DRILLED FOR $\frac{3}{4}$" BOLTS AND
BASE OF SWITCH POINT.

ELEVATION OF SWITCH POINT

SCALE ①


18"
21"
22"
S
S
S
S
S
S
S
H-2
H-3
H-4
H-5
H-6
H-7
H-8
H-9
H-10
H-11
H-12
BEGINNING OF FLOATING HEEL
ELEVATION RUNOFF IN LEAD RAILS
$\frac{3}{16}$"
$\frac{1}{8}$"
$\frac{1}{16}$"
$1\frac{7}{8}$" MIN.
(NO.1) $2\frac{9}{16}$"
(NO.2) $3\frac{5}{8}$"
(NO.3) $4\frac{5}{16}$"
$\frac{3}{4}$" BOLT
$\frac{3}{16}$" COTTER
1"
$2\frac{1}{2}$"
$\frac{13}{16}$" D

FROG NO.	TIE SPACING S
12	20"

NOTE:- WHEN ONE SWITCH POINT IS ORDERED (RIGHT OR LEFT HAND), THE TRANSIT CLIPS, STOPS, AND NO. 1 FOOT GUARD FOR IT SHALL BE FURNISHED.

POINT STOP
SCALE ③

NOTE:-

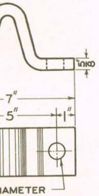
WHEN INSTALLING SWITCH FOR INTERLOCKED SERVICE, SWITCH TIES NECESSARY FOR SUPPORTING INTERLOCKING APPARATUS SHALL BE USED AND TIE ARRANGEMENT AT SWITCH POINTS SHALL BE IN ACCORDANCE WITH THE TYPE OF INTERLOCKING TO BE USED.

BILL OF MATERIAL

NAME	MARK	NO. PCS.
SWITCH POINT	R-22-0 131 RE	1
SWITCH POINT	L-22-0 131 RE	1
CLIP NO. 1 ROD	1-R-22-0 131 RE	1
CLIP NO. 1 ROD	1-L-22-0 131 RE	1
CLIP NO. 2 ROD	2-R-22-0 131 RE	1
CLIP NO. 2 ROD	2-L-22-0 131 RE	1
CLIP NO. 3 ROD	3-R-22-0 131 RE	1
CLIP NO. 3 ROD	3-L-22-0 131 RE	1
STOP NO. 1		2
STOP NO. 2		2
STOP NO. 3		2
FOOT GUARD #1		2
FT. GD. #2 INCLUDING ¾″ BOLT		2

NAME		MARK	NO. PCS.
HEAD ROD NO. 1		1-131-RE	1
ROD NO. 2		2-131-RE	1
ROD NO. 3		3-131-RE	1
PLATE S-1-A	WITH ADJUSTABLE BRACE ASSEMBLED	S-1-A	4
PLATE S-1		S-1	8 (OR 10)
PLATE S-2		S-2-131 RE	16
PLATE H-1		H-1-22-0-131 RE	2
PLATE H-2		H-2-22-0-131 RE	2
PLATE H-3		H-3-22-0-131 RE	2
PLATE H-4		H-4-22-0-131 RE	2
PLATE H-5		H-5-22-0-131 RE	2
PLATE H-6		H-6-22-0-131 RE	2
PLATE H-7		H-7-22-0-131 RE	2
PLATE H-8		H-8-22-0-131 RE	2
PLATE H-9		H-9-22-0-131 RE	2
PLATE H-10		H-10-22-0-131 RE	2
PLATE H-11		H-11-22-0-131 RE	2
PLATE H-12		H-12-22-0-131 RE	2

FIGURE IN BRACKETS IS OPTIONAL AND IS TO BE USED ONLY WHEN SPECIFIED.


$\frac{5}{8}$″
7″
5″
1″
IAMETER

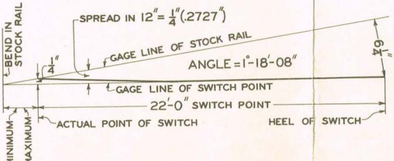

BEND IN STOCK RAIL
SPREAD IN 12″ = $\frac{1}{4}$″ (.2727″)
GAGE LINE OF STOCK RAIL
$\frac{1}{4}$″
ANGLE = 1°-18′-08″
$6\frac{1}{4}$″
GAGE LINE OF SWITCH POINT
22′-0″ SWITCH POINT
ACTUAL POINT OF SWITCH
HEEL OF SWITCH
11″ MINIMUM
12″ MAXIMUM

DIAGRAM OF SWITCH ANGLE

NO SCALE

NOTE:-

CHAMFER CUT — MAKE SWITCH POINT $\frac{1}{16}$″ THICK AND RUN OUT IN 24″ FROM END OF POINT. ROUND POINT TO $1\frac{1}{2}$″ RADIUS AND GRIND TO SHARP EDGE.

NAME OR INITIALS OF MANUFACTURER, SECTION AND WEIGHT OF RAIL, NAME AND YEAR MADE SHALL BE PLAINLY STAMPED IN $\frac{1}{2}$″ FIGURES AND LETTERS ON A RAIL PORTION OF THE STRUCTURE NOT EXPOSED TO WHEEL WEAR AND WHERE PLAINLY VISIBLE. SMALLER FIGURES AND LETTERS MAY BE USED IF ABOVE IS ON A RUST PROOF PLATE RIVETED TO WEB OF RAIL.

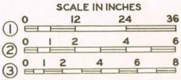
BOLTS SHALL HAVE A CLEARANCE OF NOT MORE THAN $\frac{1}{16}$″ IN DRILLED HOLES AND SHALL BE FITTED WITH SPRING WASHERS OF APPROVED DESIGN, AND COTTERS. HEADS SHALL BE REGULAR, SQUARE, AS PER TABLE 1; AND NUTS, HEAVY, SQUARE, AS PER TABLE 13 (A.S.A. B18.2-1933). THREADS FOR BOLTS SHALL BE AS PER TABLE 11 AND THREADS FOR NUTS AS PER TABLE 12 (A.S.A. B1.1-1935).

MATERIAL SHALL CONFORM TO LATEST REVISION OF STANDARD SPECIFICATIONS R-13, SWITCHES, FROGS, CROSSINGS, AND GUARD RAILS.

FOR DETAILS OF RAIL BRACE, SEE LATEST REVISION OF STANDARD DRAWING R-700, ADJUSTABLE TWO PIECE RAIL BRACE.

PLATES S-1 AND S-1-A TO BE LAGGED TO SWITCH TIMBER WITH FOUR $\frac{7}{8}$″ LAG SCREWS AND FOUR DOUBLE COIL SPRING WASHERS; DRAWING R-523.

REQUISITION SHALL SPECIFY FOLLOWING INFORMATION:
- A-TYPE OF POINT IF OTHER THAN STANDARD OPEN-HEARTH.
- B-INSULATED OR NONINSULATED RODS.
- C-NUMBER OF S-1 PLATES IF OTHER THAN MINIMUM IS REQUIRED.
- D-DIMENSIONS "TH." AND "D" ON NO. 1 ROD.


SCALE IN INCHES
①
0
12
24
36
②
0
1
2
4
6
③
0
1
2
4
6
8

APPROVED FOR USE

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
G D Brooke
VICE PRESIDENT

ERIE RAILROAD COMPANY
R E Woodruff
VICE PRESIDENT

THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY
G D Brooke
VICE PRESIDENT

PERE MARQUETTE RAILWAY COMPANY
Bowman
VICE PRESIDENT

J.R.S. D.L.A.	W.S.E.	J.R.S.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY
ERIE RAILROAD COMPANY
THE NEW YORK, CHICAGO AND St. LOUIS RAILROAD COMPANY
PERE MARQUETTE RAILWAY COMPANY

STANDARD 131-LB. R.E.
22′-0″ SPLIT SWITCH
WITH UNIFORM RISERS

APPROVED BY
ADVISORY COMMITTEE ON WAY AND STRUCTURES

APPROVED
JUNE 18, 1935

CHIEF ENGINEER

SHEET 1 OF 2

R-680-A